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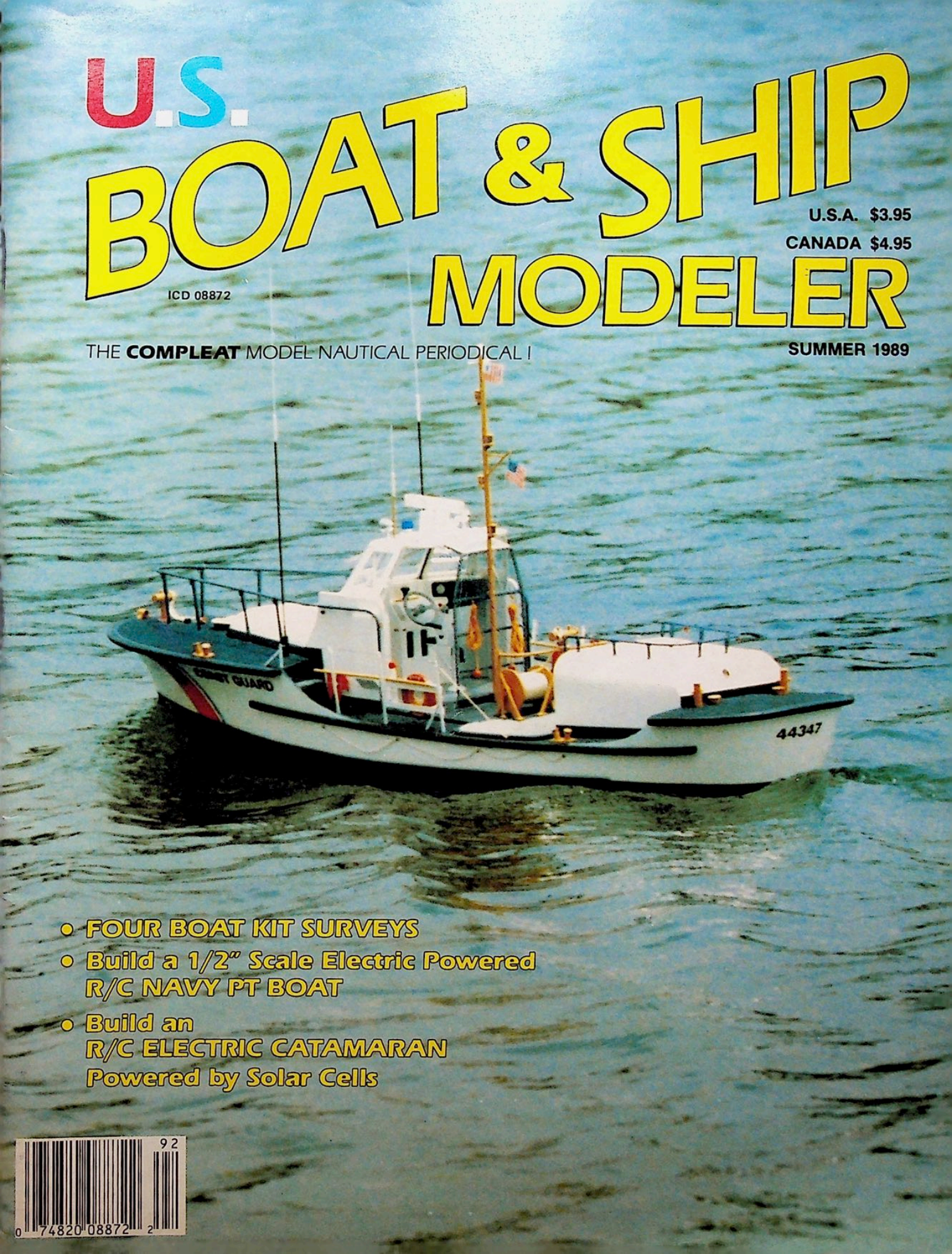

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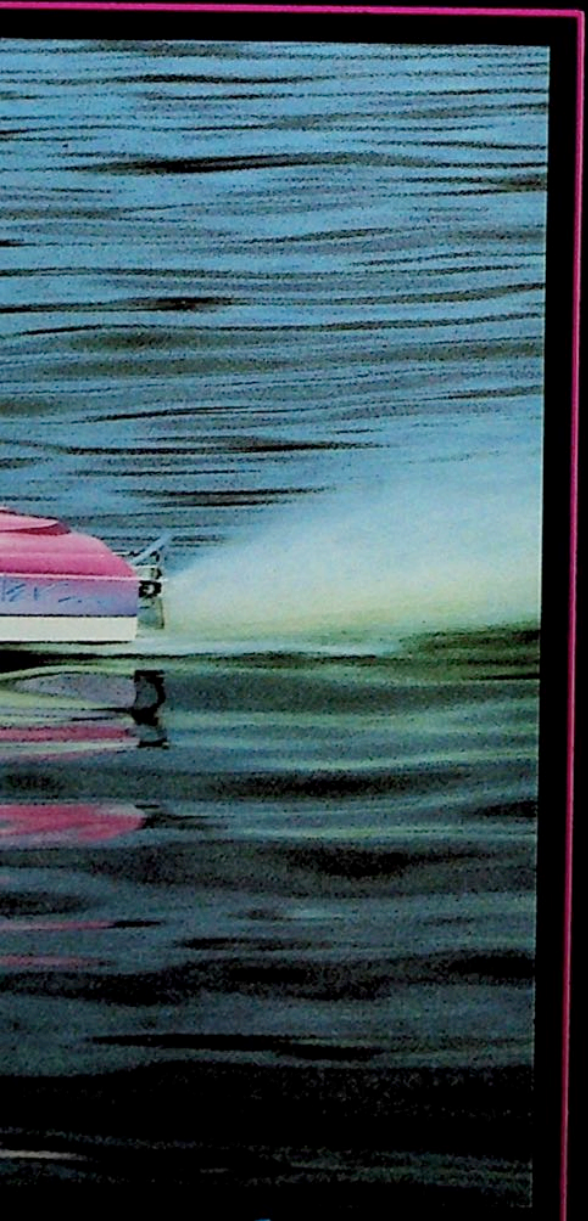

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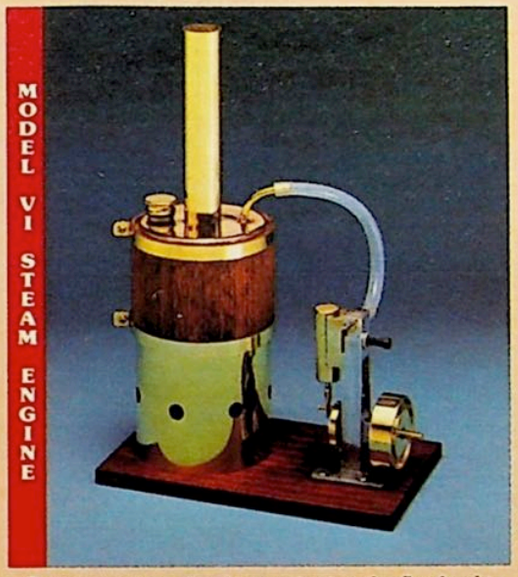
Success Series®
This kit features a complete and fully illustrated step-by-step construction manual AND full-size plans that ASSURE SUCCESS!



Operation is as simple as spinning the flywheel to start the engine. The three moving parts require only occasional lubrication. The boiler is maintenance-free. The engine and boiler are attractively and securely mounted on a 3" x 5" mahogany base included in the kit.

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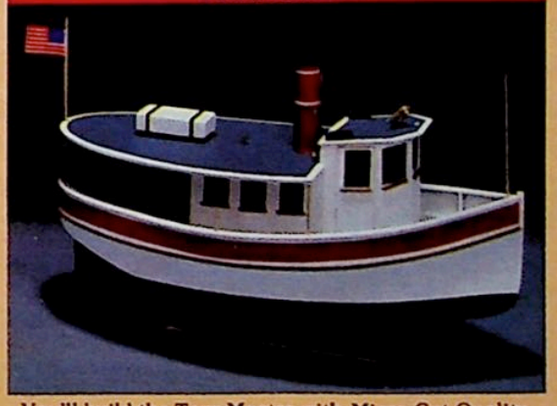
Adaptable to steam power with Running Hardware Kit #825 and the Model VI Steam Engine.

Requires 2 Channel R/C System.

Length Overall: 19" Beam: 7¾" Scale: 1" = 1'

Kit #958 **$47.95/suggested retail price**

TOUR MASTER



You'll build the Tour Master with Micro-Cut Quality Basswood, Balsa, Mahogany and Micro-Lite® Plywood parts, and cleanly die-cut frames, keel, cabin/pilothouse, deck, canopy roof, rudder & stern seat. A complete Fittings Set includes cast metal britannia fittings. Eagle Decoration and American Flag are included for that added touch of realism.

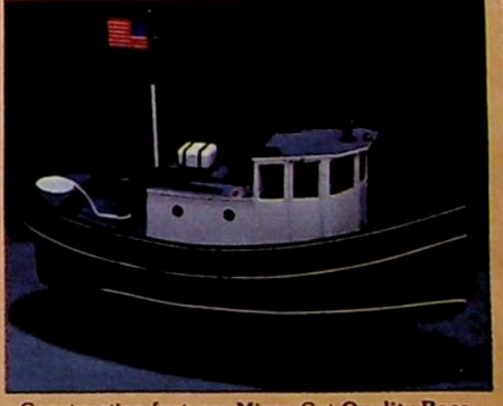
Adaptable to steam power with Running Hardware Kit #825 and the Model VI Steam Engine.

Requires 2 Channel R/C System.

Length Overall: 19" Beam: 7¾"
Height: 10" Scale: ½" = 1'

Kit #961 **$60.95/suggested retail price**

HARBOR MASTER



Construction features Micro-Cut Quality Basswood, Balsa, Mahogany and Micro-Lite® Plywood parts, with cleanly die-cut frames, keel, cabin/pilothouse, deck and rudder. A complete Fittings Set includes cast metal britannia fittings, and features brass portholes, rudder post & tube and brass whistle parts. American Flag is included for that added touch of realism.

Adaptable to steam power with Running Hardware Kit #825 and the Model VI Steam Engine.

Requires 2 Channel R/C System.

Length Overall: 19" Beam: 7¾"
Height: 12¾" Scale: ½" = 1'

Kit #962 **$57.95/suggested retail price**

Prices subject to change without notice.

MIDWEST PRODUCTS CO., INC.

U.S. BOAT & SHIP MODELER

SUMMER 1989

volume 3, number 9

Corporate Office: 898 West Sixteenth St., Newport Beach, CA 92663 Ph. (714) 645-8830

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Cover: Model of a US Coast Guard 44-foot lifeboat, built by Rich Lauriano, San Diego, California. Rich modified a Dumas kit to replicate this particular vessel. Photo by Bill Northrop taken at the Mission Bay Model Yacht Basin, San Diego. See *Cap'n's Log* in this issue for announcement of a major competition for scale US Coast Guard ship models, in Newburyport, Massachusetts, July 15 to September 15, 1990, commemorating the Two Hundredth Anniversary of the founding of the United States Coast Guard (1790-1990).

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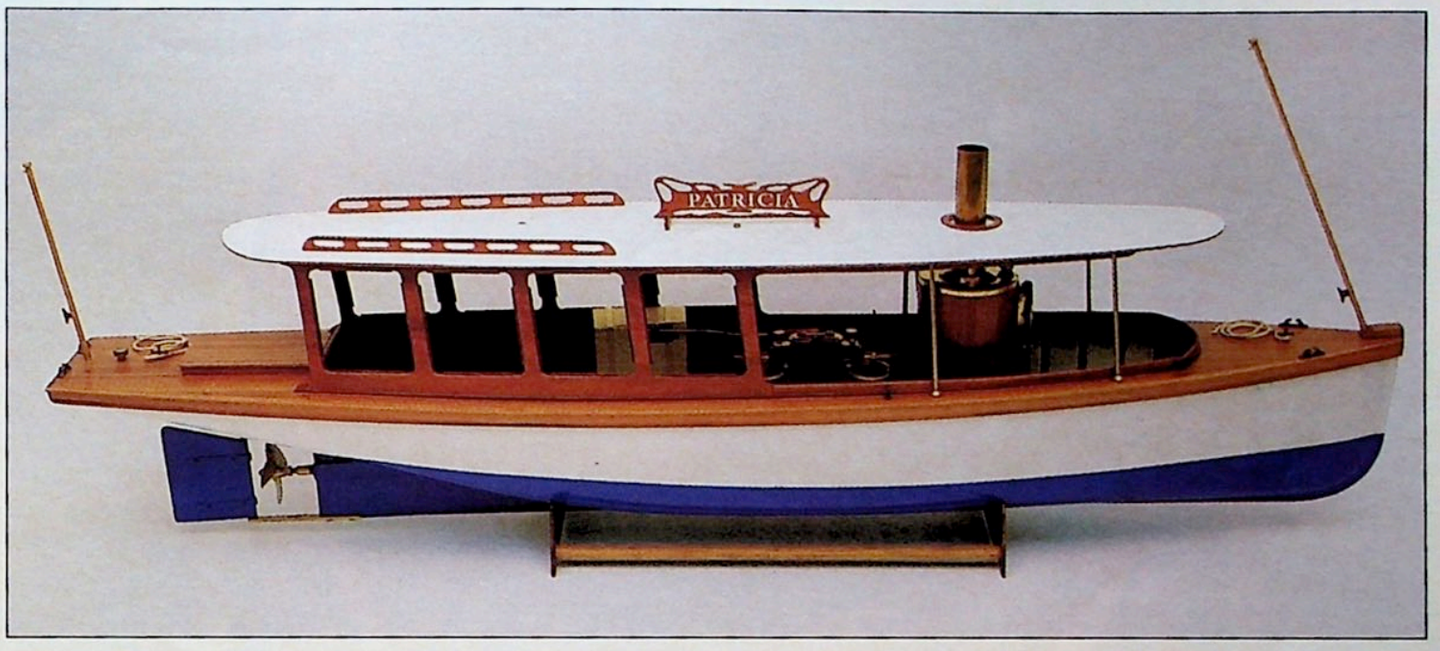
Elegant Steam Powered Yacht comes with Steam Engine!



Patricia **includes** a complete two-cylinder, self starting, reversible and throttleable steam engine! This boat is a 35" long, 7" beam, 11" tall **exact** scale model of a steam cruiser which was built in England and operates even now on the Bodensee in southern Germany. The kit is quite easy to assemble because the entire hull is preformed ABS. The deck is diecut plywood onto which you glue mahogany strips to give the look of authenticity.

The steam engine is included in semi-kit form. Assembly is simple. The butane fuel tank and burner are fully assembled and can be quickly recharged with butane cigarette lighter fuel. The scale vertical boiler is usable as provided except that you will surely want to glue the scale mahogany planking to it with cyanoacrylate glue simply because this continues the exact scale impression.

Patricia slips through the water under steam power with only the soft sound of the twin pistons pumping. Boiler water is ejected overboard from a hull port after the steam condenses from the pistons. The slim bow cuts the water leaving a trim wake. Maneuverability is excellent during docking and reversing. And when you've finished sailing her she looks magnificent on your mantle.

HLKK2023 HL/Krick
Patricia RC Steam Yacht with Engine ... $349.00
List price $450.00

Buy Patricia's Steam Engine for other boat projects!

HLKK201C **Complete Steam Engine with Medium Boiler $284.70**
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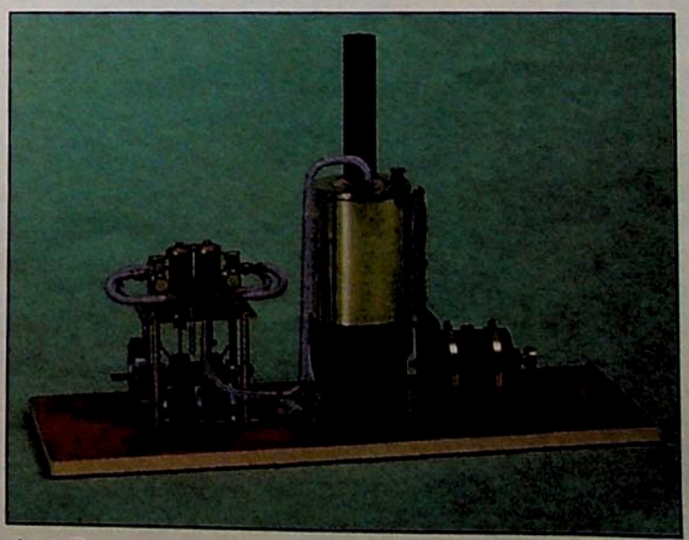
The engines are identical in both. The Small Boiler is 5⅞" high, and 2⅝" diameter with an overall height to the top of the chimney of 9½". The Larger Boiler is 6" high, and 3¼" diameter with an overall height to the top of the chimney of 10½". The Boilers do not include the mahogany planking.
The Engine is self-starting, throttleable and goes forward or reverse. Fill the Gastank with butane lighter fuel. This is clean burning and easy to light.
The engines come unassembled, but the boilers and fuel tanks are ready made.



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SYSTEMS
Choice of dual stick or pistol grip Futaba transmitter
All Futaba radio equipment Factory-installed
Available with: MC112B MOSFET speed control
E.P. insert makes Candy unsinkable
Power and speed propellers included
Driver, decals and marine hardware included
V-shaped hull, molded in high impact ABS

FOUR SWEET DEALS.

Get into radio controlled model boating in a hurry with Candy, the RC speedboat that's ready for fun.

Factory-assembled and Futaba-equipped, Candy zips through water with a sleek, V-shaped hull of high impact ABS for ski boat speed and maneuverability.

Unsinkable by virture of an expanded polystyrene radio tray/insert, Candy is extremely stable, easy for even novice

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Candy w/2P system, R102GR receiver, S148 servo and MC112B speed control. W/72V/1200mAH Charger

TWO
Candy w/2NBL R102GR Receiver, S148 servo, and MC112B speed control. W/7.2V/1200mAH Charger.

THREE
Candy w/2P system, R102GR receiver and S148 servos.*

FOUR
Candy w/2GS system, R102GR receiver and S148 servos.*

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Careful attention to detail in molding and decals allows even beginners to build a boat in a few hours that they will be proud of for years.

If you want speed and excitement from a Fast Electric Boat, "THIS BUD'S FOR YOU."

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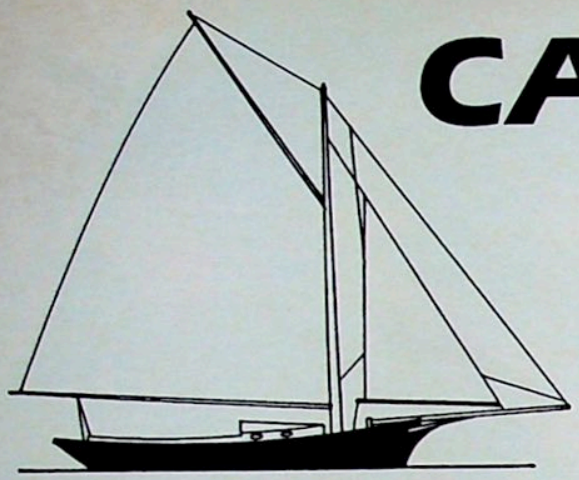
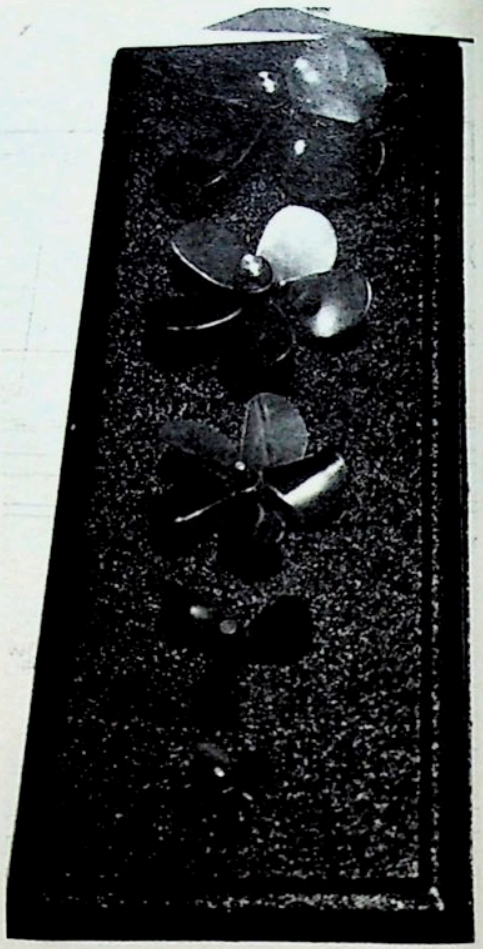


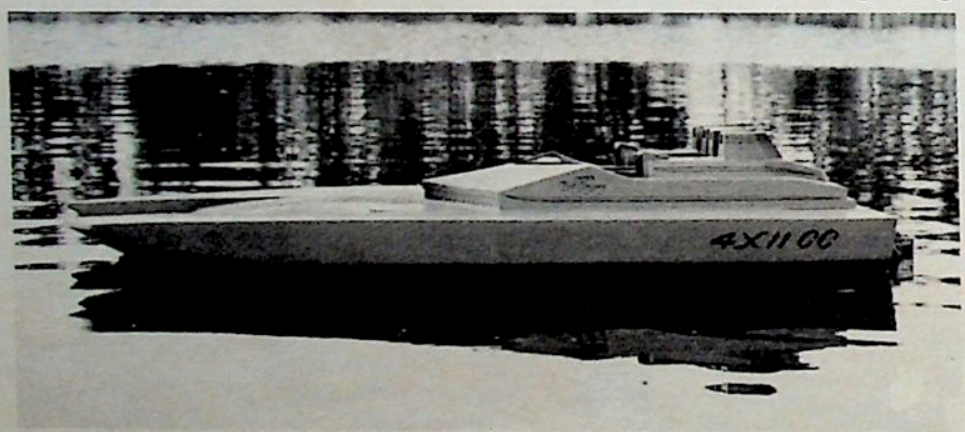
CAP'N'S LOG

By BILL NORTHROP . . .



Variety of props available from Dynamic Models, seen at N.Y. WRAMS show.

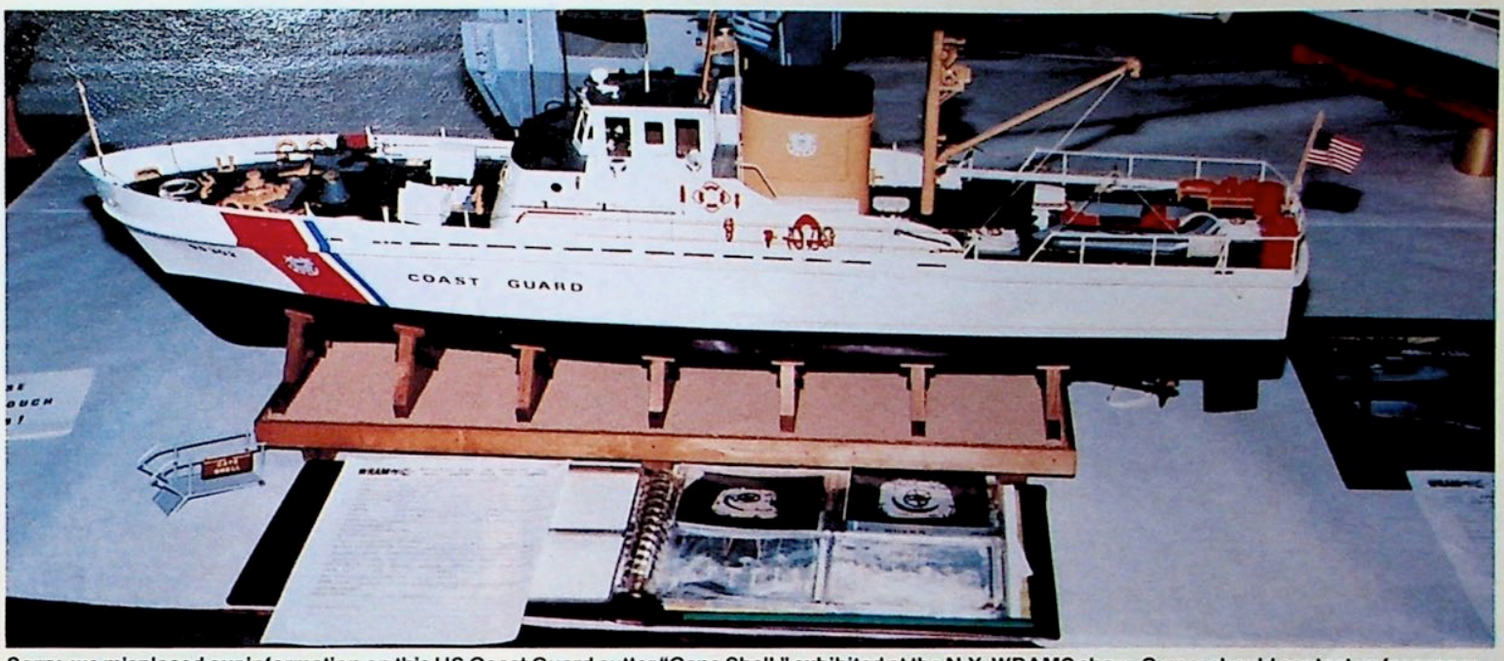
The FAI (Federation Aeronautic Internationale), based in Paris, France, is the world organization governing international sporting aviation competition regulations and world record acknowledgements in aviation. Its scope includes powered aircraft, gliders, helicopters, parachutes, balloons, hang gliders, and even model aircraft. Any country in the world wishing to become involved in officially recognized international competition and/or to establish new records of accomplishment in any aviation category, must be a member of the FAI. Any nation having or seeking membership in the FAI must first have a national sporting aviation club of its own, which upon acceptance, becomes an official affiliate of the FAI, representing that nation. In the USA, the national aero club of all sporting aviation is the NAA (National Aeronautic Association), within which the Academy of Model Aeronautics is its model airplane affiliate. Among the many aviation organizations belonging to the NAA, such as soaring, racing, aerobatics, parachuting, etc., AMA is, by far, the largest in membership.



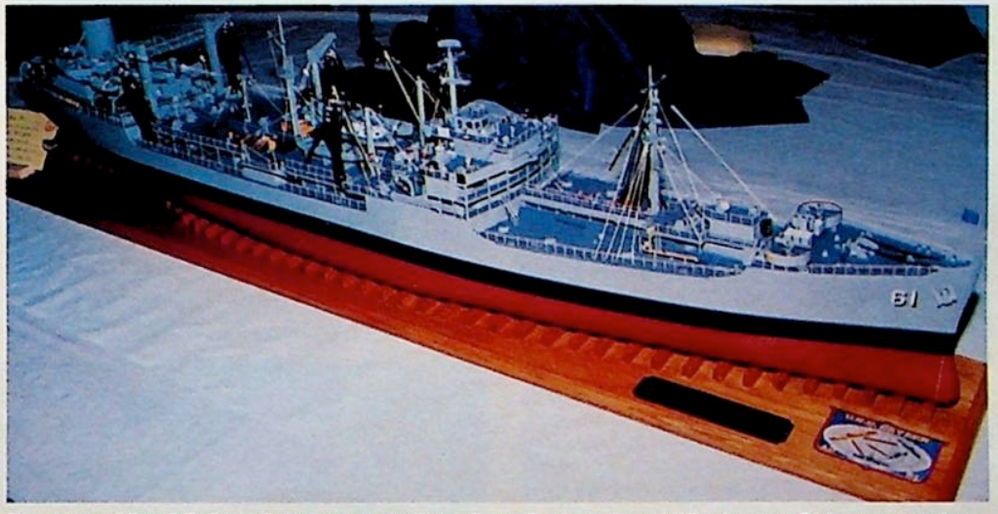
Hmmm. Strange looking catamaran by Bob Gregory, of Westminster, CA. The answer is on page 9.

Prize winning oil tanker "Imperial Skeena" at Toledo R/C Expo. By Hal Wyatt, North York, Ontario, Canada.

This writer has experienced involvement with the FAI through NAA and AMA at various times over the past 25 years. In 1965, flying a powered aircraft we especially designed for the task (called the "Foo Too" in memory of Gary Powers' high altitude flights), we set a world altitude record for an R/C model at 16,610 feet, that stood for three years. The flight was accomplished at the Naval Weapons Lab in Dahlgren, Virginia, using their visual missile tracking equipment to fly the plane, and X-band radar to confirm the altitude. Later, at the same facility, we set a glider speed record of not quite 30 mph that only lasted a few months (completing the specified upwind and downwind course in one flight was more difficult than attaining a decent airspeed back then!). I later judged World Championship radio controlled aerobatic competition and/or served as Chief Judge for the same in Germany, Switz-



Sorry, we misplaced our information on this US Coast Guard cutter "Cape Shell," exhibited at the N.Y. WRAMS show. Owner should contact us for proper identification, and credit for a beautiful job.



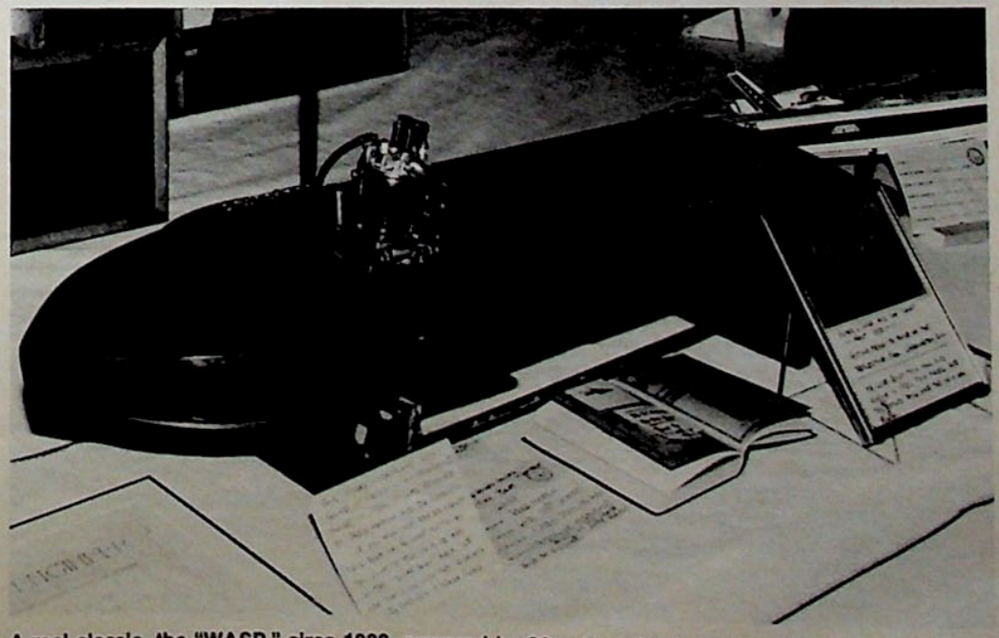
The Navy Oiler AO-61 U.S.S. Severn, built by Dave Barber, Canal Winchester, Ohio, was a prize winner at the Toledo R/C Expo.

erland, Mexico, and the USA. Was also Chairman and/or member of the AMA R/C Contest Board for many years, heavily involved in setting rules for aerobatic and scale competition.

All of the preceding is leading up to our recent "discovery" that model boating appears to have a world governing organization similar to the model portion of the FAI, which is also based in Europe. It is called NAVIGA, and the most startling part of our discovery is that the USA is NOT a member nation! Our previous thoughts and commentary on the need for a national organization of scale boating had to do with the "nationalization" of rules for competition . . something that is sorely needed if one has thoughts of traveling out of ones own back yard to pit building, researching, and scaling abilities against contemporaries in other parts of the country. That was why we picked up on the SSMA (Scale Ship Modeler's Association), which seemed to be an organization with the proper tools and personnel to take on the job.

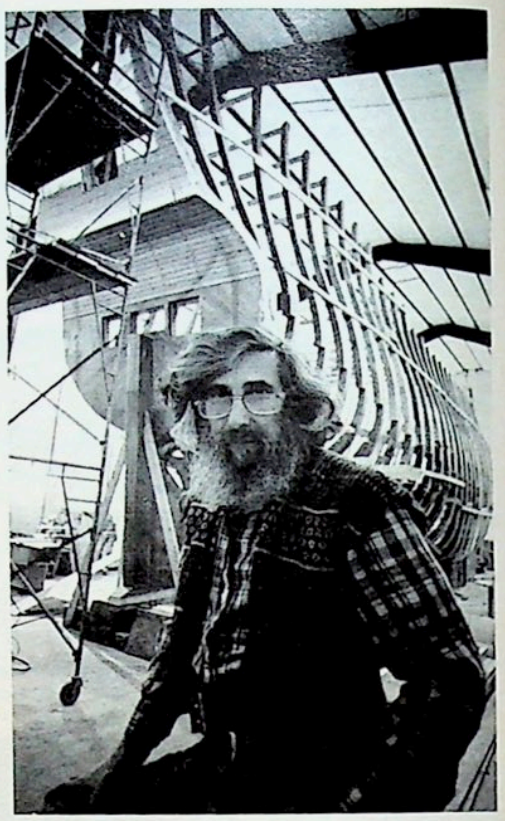
Since then, we have come across two incidents where ship modelers were denied entry in European scale ship model competitions because the United States was not a member of NAVIGA. Further inquiry brought out the following conclusions. NAVIGA is to world class scale model boat competition as FAI is to world class model airplane competition. No tickee, no washee! If your country doesn't have a national organization recognized by NAVIGA or FAI, you can't play in their ballpark. Simple as that.

At the 1989 Toledo Weak Signals R/C Exposition, we chatted with John Fryant, of NRG, and with Dave Hampton, who is National Director of SSMA. Both indicated strong interest in developing a national organization in the USA that will work toward unified scale judging rules and toward



A real classic, the "WASP," circa 1932, powered by 20cc homebuilt engine, all created by Elmer Luke. Now owned by Reed Martin, Cabin John, MD.

First in a series of well known figures in the American wooden shipbuilding industry to participate, Don Johnson puts his skills to work on replica of Henry Hudson's "Half Moon," under construction by The Rigging Gang, Albany, NY. Battery powered drill/screw driver seems out of place. Should be a good old brace and bit!



Artist, author, sailor, and shipbuilder, with the Half Moon replica in the background.

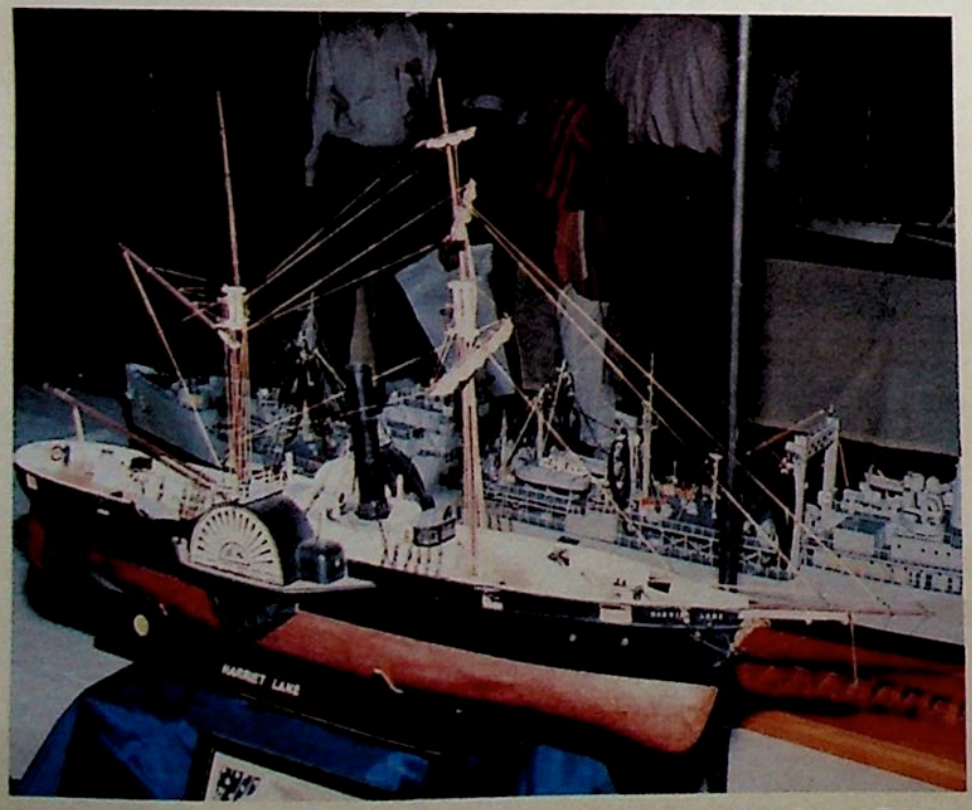
affiliation with NAVIGA. Dave indicated that our comments in previous issues of USB&SM have sparked interest from readers in other parts of the country, resulting in many new SSMA memberships outside of the basic SSMA territory. Dave followed up that conversation with the following news release:

SSMA TO SEEK INTERNATIONAL AFFILIATION

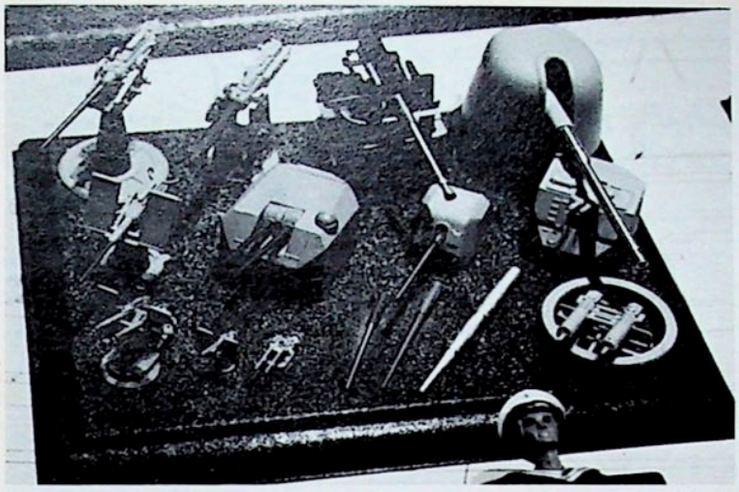
SSMA officers recently announced that SSMA will seek affiliation with Naviga (World Organization of National Associations). Naviga is an organization that is the "World Series" of model competition. All persons who participate in Naviga competition must adhere to some of the most voluminous and rigid of rules. People who judge at Naviga sanctioned events have the title of judge bestowed upon them. The main focus of Naviga is centered on static models, but R/C models can compete as well. Naviga has a set of prescribed categories in which the models, depending on their type, can be placed. Thus far, all Naviga events have been held in such European countries as Germany and Belgium.

It is not expected that once SSMA is affiliated with Naviga, a horde of US modelers will be planning European vacations around Naviga events. What has happened is that SSMA has

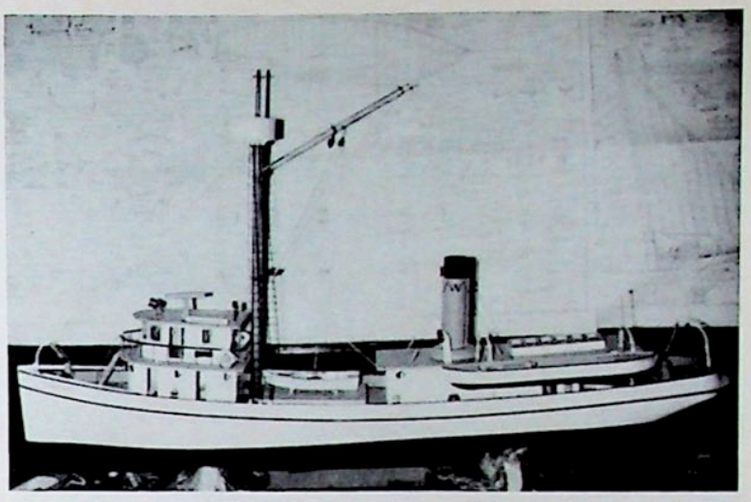
Seen at the Toledo R/C Expo, this typically crowded excursion steamer, by Bob Burns, of Troy, Michigan, is appropriately named "Pleasure."



Civil War sidewheeler "Harriet Lane," built by Bob Cline, Huntington, Indiana. Seen at Toledo R/C Expo.



Assortment of guns for military ships available from Dynamic Models, displayed at WRAMS show, New York.



Bunker Boat from USB&SM plans, built by A. Wasco, Bridgeport, CT. Features revolving radar head powered by Polaroid Film Batteries.

already received a few inquiries from modelers stating that they want to compete in a Naviga event but cannot because Naviga rules require that the participants be members of a national organization within their country. SSMA is seeking to associate with Naviga not only for the purpose of allowing its members to participate in Naviga events, but to help SSMA gain access to the wealth of knowledge that has already been amassed by the Naviga officials, in the form of rules and guidelines. Several British model clubs already use all or part of the Naviga rules in their scale judging. SSMA will take the Naviga rules and offer them to the SSMA clubs as a reference source for possible use.

Even though SSMA may associate itself with Naviga, it is not the organization's intention to ignore one of its most important responsibilities, which is to help the novice modeler. Only a small portion of the modeling community is ever expected to venture across the big pond to a Naviga event, but all modelers, whether they are novice or professional, can benefit from the association with modelers from all levels of modeling and from other countries.

SSMA would appreciate receiving any comments that anyone might have about SSMA and its affiliation with Naviga and any other comments about SSMA in general. Contact Dave Hampton, SSMA, 5218 Laurel Hall Dr., Indianapolis, IN 46226.

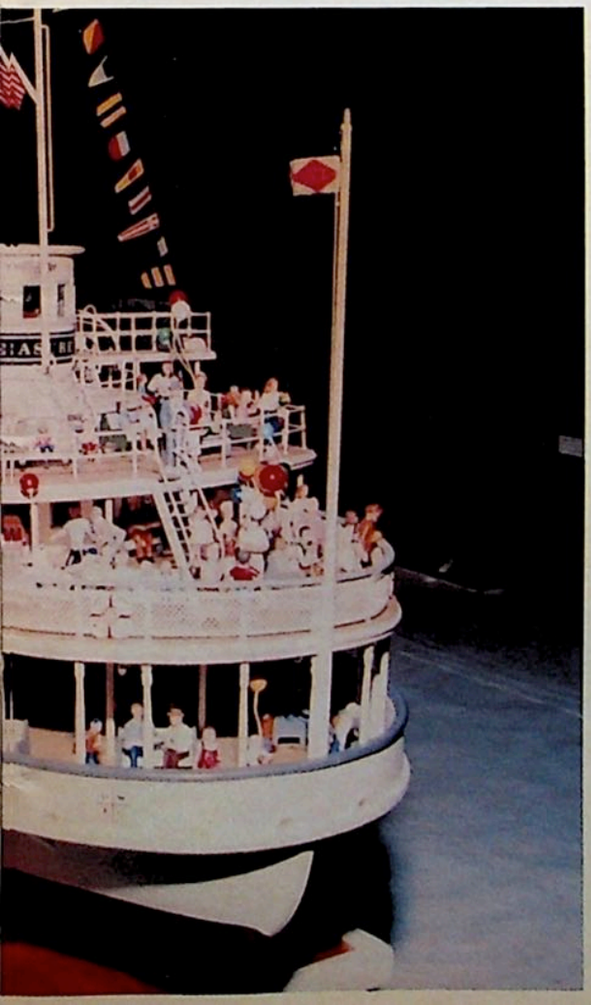
THINGS TO DO

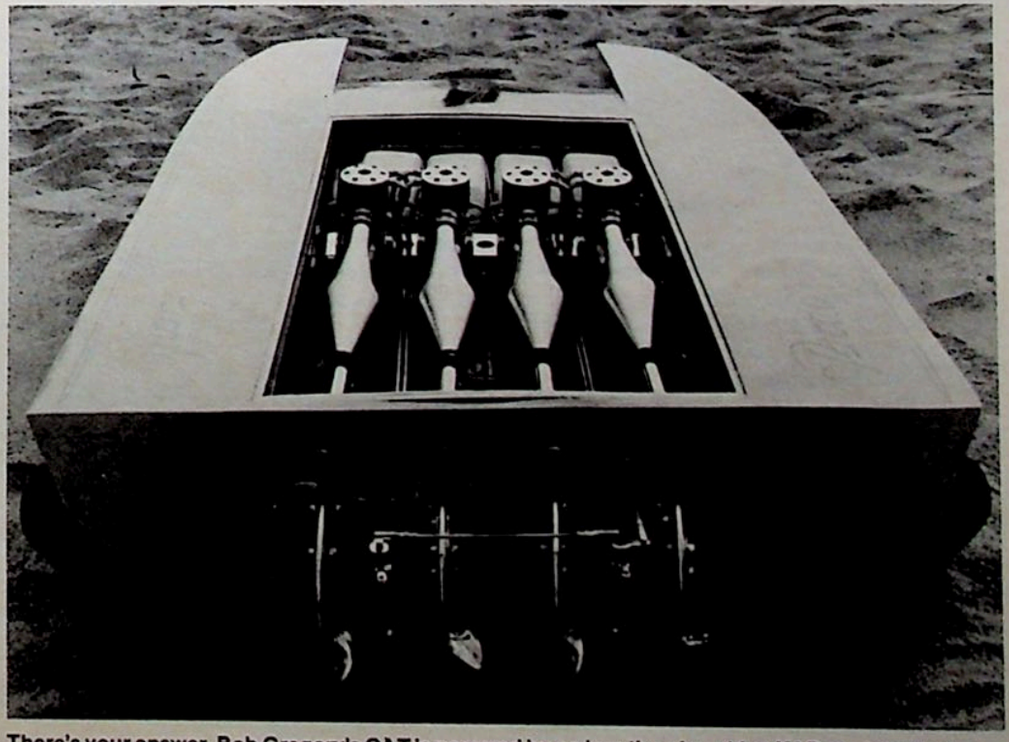
The First Annual Precision Steering contest of the Maryland Attack Group will be held at Burba Lake, Fort Meade, Maryland, on June 10, 1989 (rain date June 17). Registration at 9 am, contest 10 am to 6 pm. Contact Martin Hayes, President, at (301) 757-5593, or John French, (301) 266-6757 for additional information.

* * *

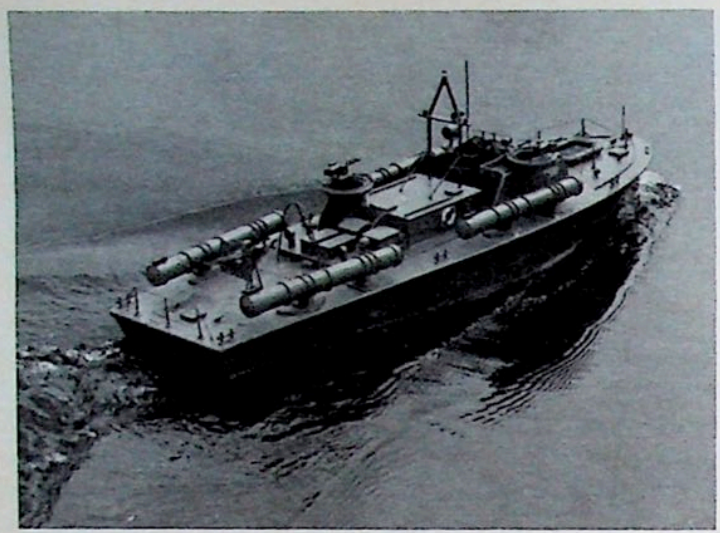
The San Diego Ship Modelers' Guild will have its twelfth annual Scale Model R/C Regatta on Saturday, June 17, 1989, at the Model Yacht Basin, San Diego's Mission Bay Park. Contest open to all types of scale ships and boats (hydroplanes excepted), and is limited to steam, electric, or sail power. Static categories will include powered military, powered civilian, and all sail. R/C operational categories will be steam, all sail, electric military,

Continued on page 79





There's your answer. Bob Gregory's CAT is powered by no less than four 11cc K&B engines! Is that awesome, or what!



WW-II PT BOAT

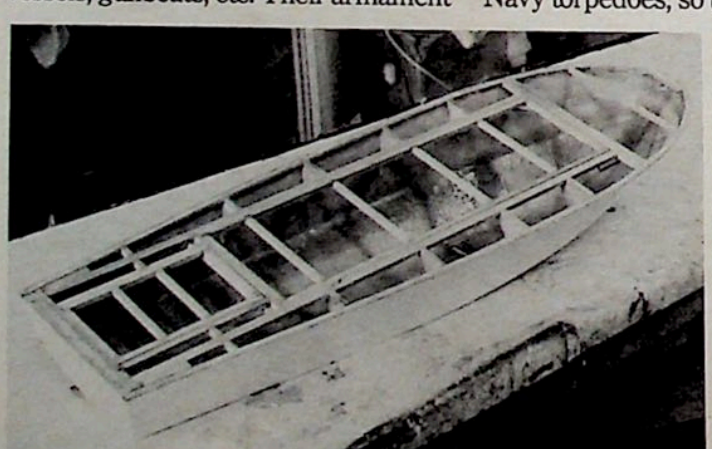
By the late ART BAUER . . . A commercial for Dynamic Models? Well, maybe. But all you get is a fiberglass shell, and the rest is up to you. This will help you through the scratch-building of many R/C scale power boats.

PT Boats in WWII were "weapons of opportunity" that carried the fight to the enemy on a variety of missions. They met the enemy at closer quarters, and with greater frequency than any other type of surface vessel.

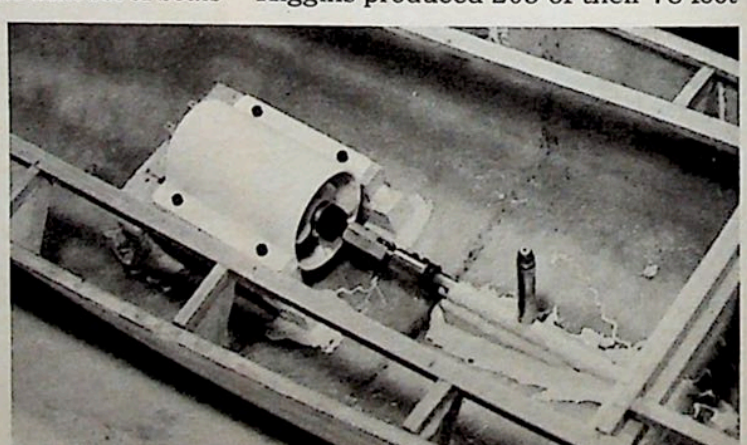
Built originally to perform the mission that their name, patrol-torpedo boat, implied, they wound up being used as sub-chasers, assault-support vessels, gunboats, etc. Their armament varied from the original two twin .50 cal. machine guns and four torpedo tubes, to vessels equipped with 20mm, 37mm, 40mm, and 75mm guns, depth charges, and 4.5 in. and 5 in. rockets.

PTs varied in size; the first experimental boats, which were copied from a British design, were 70 footers. These were found to be too small to carry four standard 21-inch diameter U.S. Navy torpedoes, so the next set of boats were increased in size to 77 feet overall, models of which saw service at Pearl Harbor and the Philippines at the beginning of WWII.

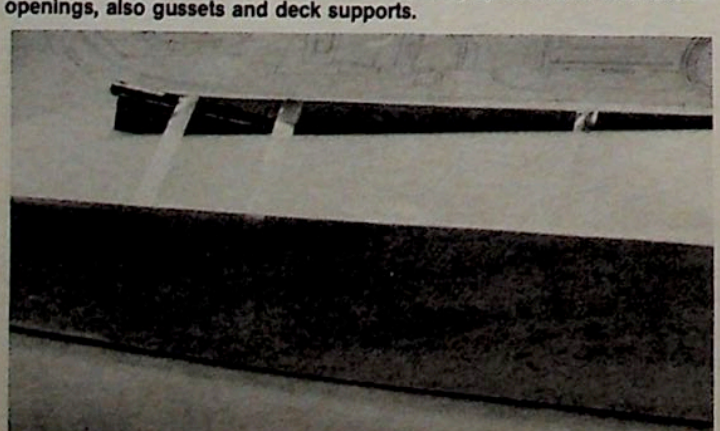
Demands for a more seaworthy boat that could carry heavier loads led to the 78 foot model by Higgins, and the 80 footer from Elco. These two boats became the standards for the Navy. Elco turned out 320 of the 80 footers, while Higgins produced 205 of their 78 foot



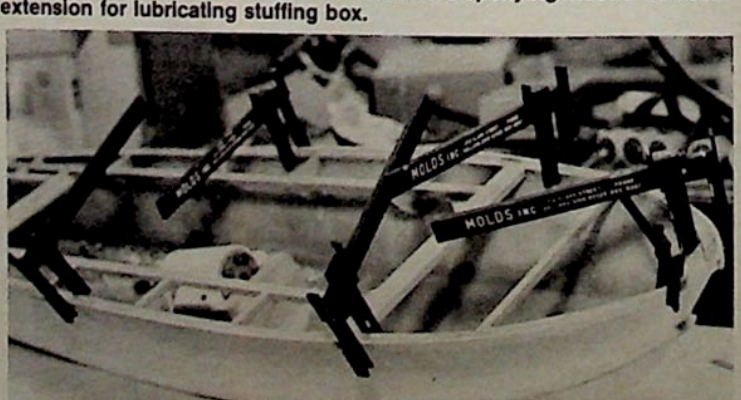
Complete hull framing installed. Note temporary spreaders across hatch openings, also gussets and deck supports.



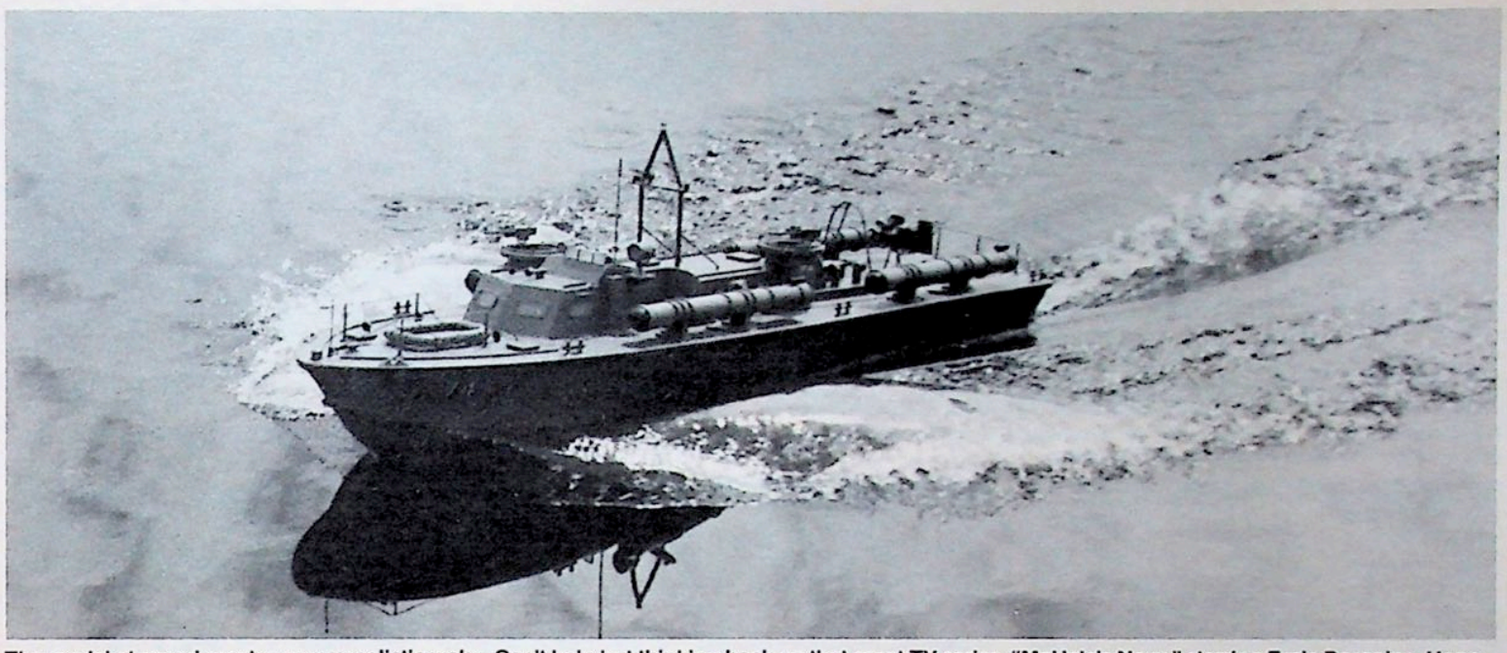
Electric drive motor is lined up with shaft before epoxying mount. Vertical extension for lubricating stuffing box.



Keel and shaft housing (stuffing box) held in place for epoxying.



Chines and rub rails are soaked, bent to shape, and clamped in this manner, before gluing.



The model at speed creates a very realistic wake. Can't help but thinking back on that great TV series, "McHale's Navy," starring Ernie Borgnine. Hope they'll re-run them some day.

boats.

PTs were designed for speed, and in their speed was their beauty. They were squat and beamy when lying dead in the water. However, as a PT gained speed, it lifted it's bow clear of the water and began to plane over the surface, throwing out water from the chines on either side and a rooster tail astern.

As fast as they were, the speed of PTs have always been exaggerated. They did not make 70 knots, or 60 knots, or even 50 knots. With proper maintenance, ie: a clean bottom, engines tuned up, and with everything just right, a PT could be expected to turn around 40 knots (45 mph) without difficulty under a normal war load. In looking for a scale model boat, simple to construct, that would perform at high speed, what better subject than a PT boat?

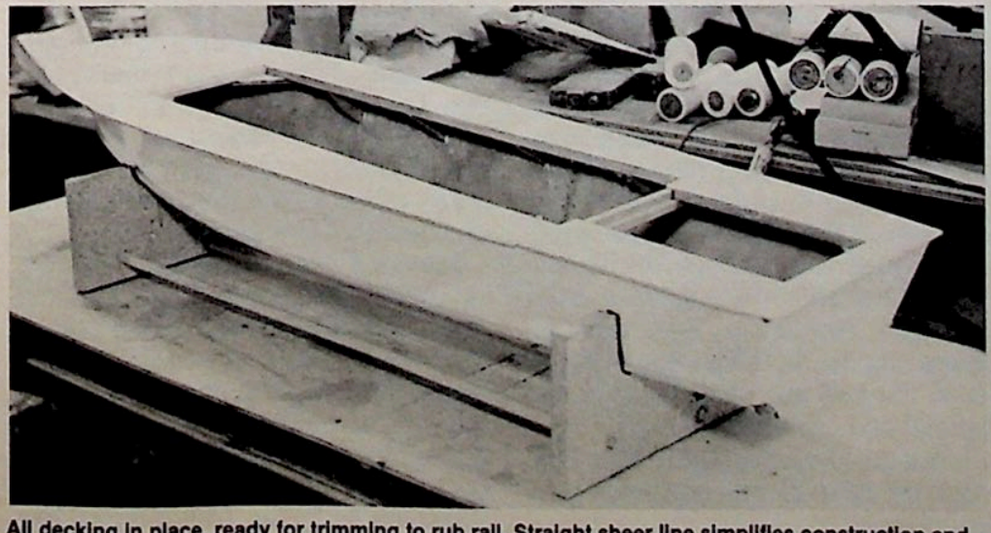
The model presented here is of a typical WWII 78-foot PT boat in 1/2-inch scale, built using the fiberglass hull, plans, fittings, and accessories available from Dynamic Models, Drawer 'C,' Port Jefferson Station, New York 11776 (catalog $5.00). Typical is the word used, because as soon as these boats left the yard after commissioning, they were "customized" by their crews and no two ever wound up alike, even when in the same squadron. Plans also available from Dynamic for the "Elco," 'Higgins," 'Komar," and "Nasty" class PTs.

The PT model is easy to build, and when running, is fast and maneuverable, and gives the appearance of a full size boat with the water thrown out in a scale manner.

HULL

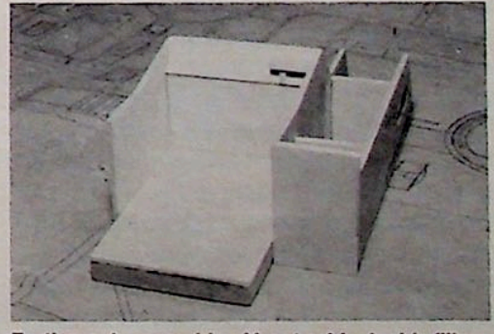
Sand the inside of the hull where the deck framing and the running gear components will be installed. This is to remove the surface wax of the resin used in the hull lay-up, and will insure a good bond between the fiberglass of the hull and any parts that may be glued to it.

Fit 1/4 sq. spruce strips to the top edge of the inside of the hull. You will have to kerf an area about 12 inches long in the bow end of each of these strips to get a good fit to the curvature of the hull. Soak these strips and clamp them in place until dry so that they will assume the correct shape. After they are dry, glue them to the hull along the top edge of the hull. After the glue has

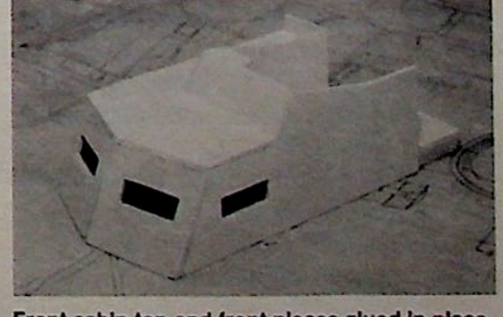


All decking in place, ready for trimming to rub rail. Straight sheer line simplifies construction and alignment of superstructure.

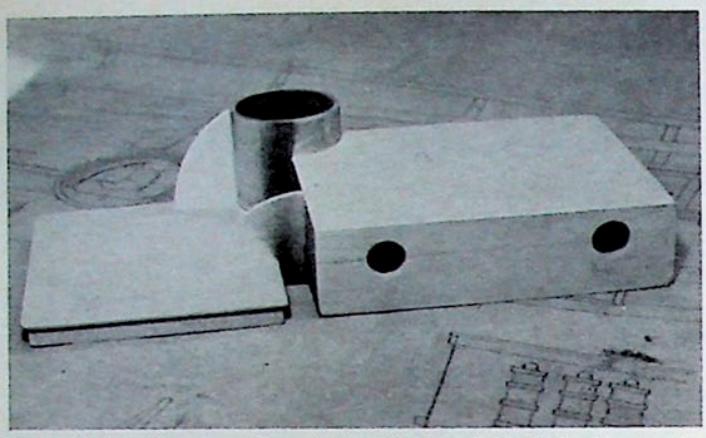
Model clamps hold parts in squared position, ready for application of cyano glue.



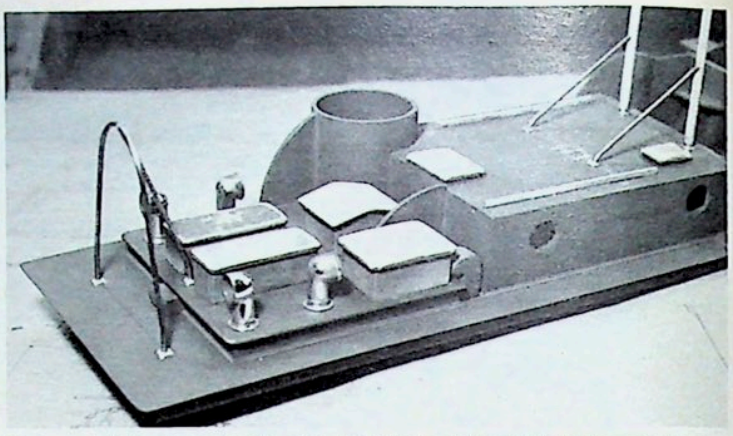
Further sub-assembly of front cabin. Inside fillers located to clear gun turret base inset.



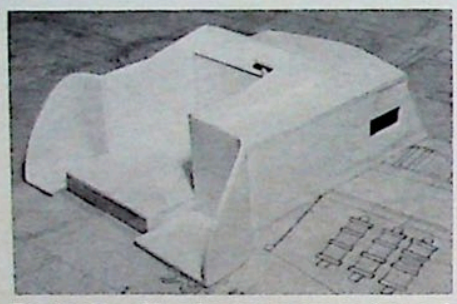
Front cabin top and front pieces glued in place. Windows cut parallel to roof line.



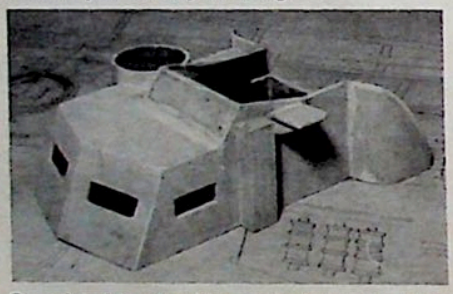
Rear/middle cabin assembly ready for finishing. Cabins joined by turret and shields. Turret is Plastistruct ABS tubing.



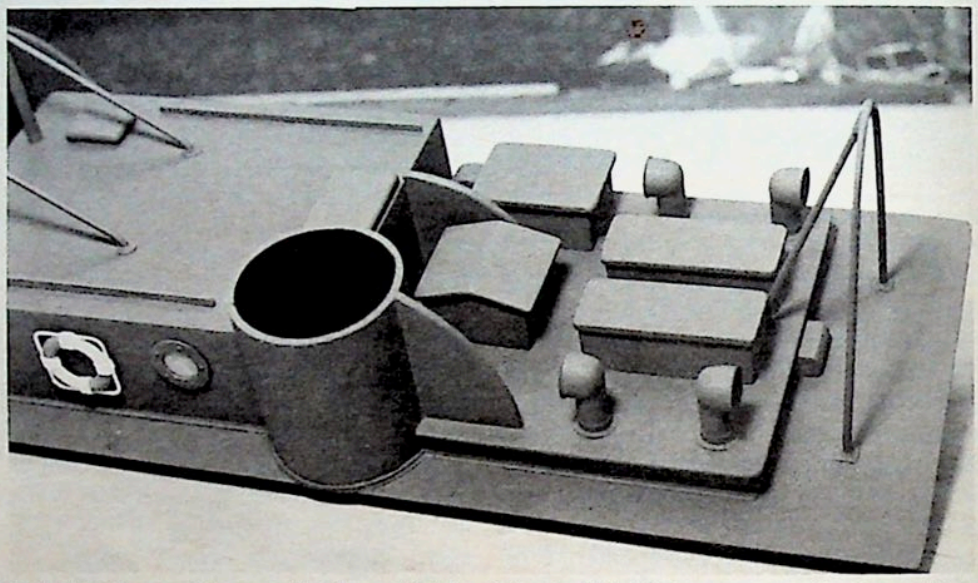
Starboard side of rear cabin superstructure, with all detailing, ready for typical flat Navy gray painting.



Front cabin with entranceway armor plate and floors in place, ready for filling.



Completed front cabin, ready for paint. Note blending of turret base and antenna support.



Port side of rear cabin superstructure with flat paint added. Ventilators are operative to provide motor and battery cooling in model.

set, fill in the kerfed areas with body filler and sand them level with the hull top edge.

Cut and fit the 1/4 sq. and 1/4x3/8 spruce strips for the remainder of the deck framing as shown on the plans, making sure that the interior frames, where the superstructure and rear access hatch frames will fit, are square. This will avoid a lot of problems later on when the deck coverings are put in place. Use 1/32 spacer strips all around the main deck interior framing, or 1/16 spacer strips on one lengthwise and one crosswise side of the deck interior framing before building the superstructure and rear access hatch frames. When these frames are now built tightly against the interior frames, they will, when complete, have a clearance all around of about 1/32. More than that amount of clearance is not needed in a model of this type.

When all glue has dried, coat the entire framing with resin. Not only will it waterproof the framing, but when dry, will give a real secure final gluing.

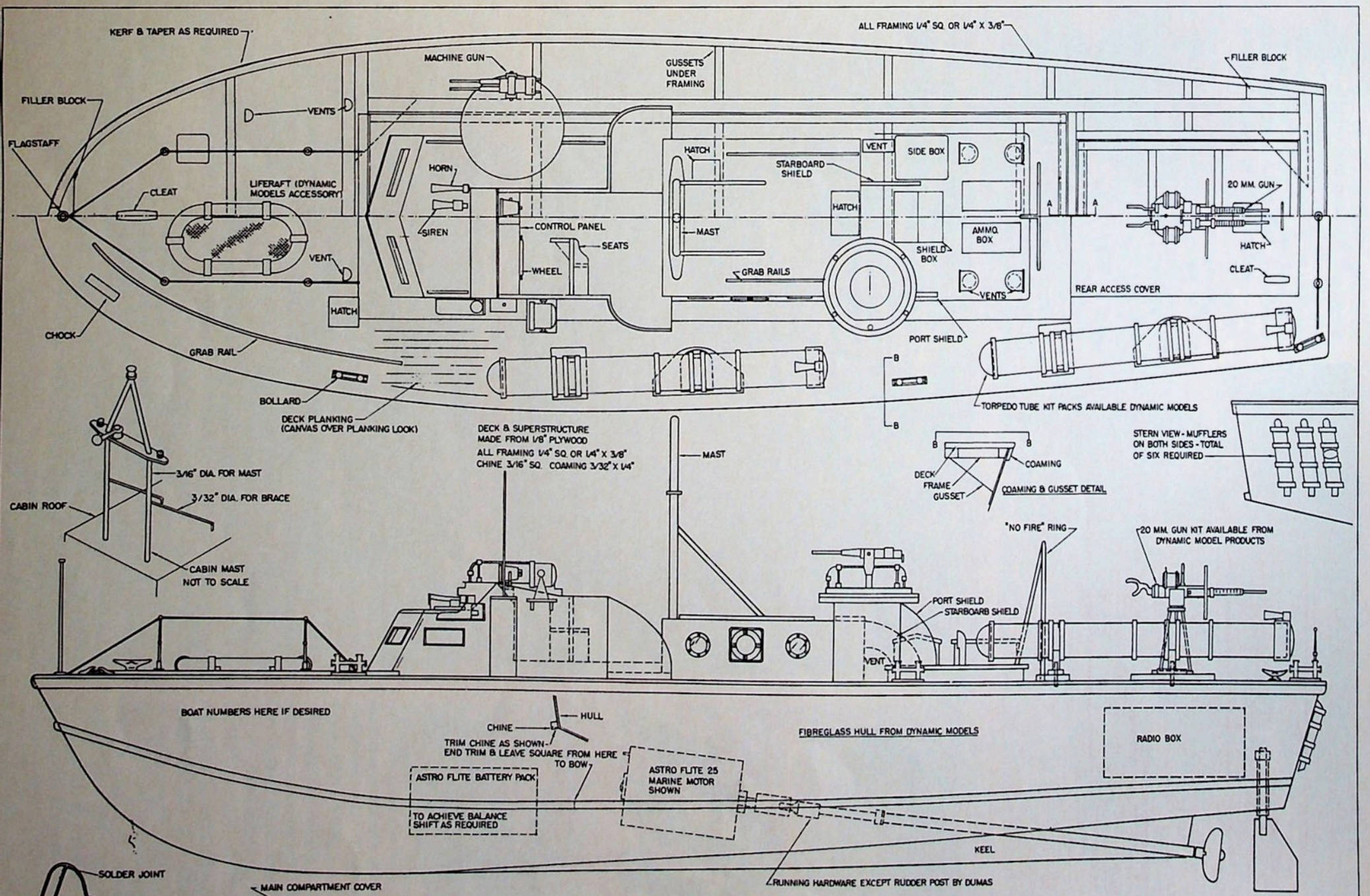
Lightly sand the hull exterior where the keel, chines and rubrails will be positioned to insure a good bond.

Cut a piece of 1/4-inch plywood to the shape of the keel as shown on the plans, making it full length to include the area shown on the plans for the shaft housing. Measure the outside diameter of the shaft housing you are using and cut this amount from the stern end of the keel blank. Lay the keel on the plans and mark off the shaft angle and location of the shaft housing at forward end. Cut the keel along the marked line. By making this one cut, you will now have the correct angle to install the shaft housing as well as having the keel come out the proper length. Mark the location of the hole through the hull for the shaft housing and drill and shape as required. Place the keel pieces and the shaft housing in place, holding them with Scotch tape. When they are properly aligned with the bow of the hull, epoxy the shaft housing in place. After the epoxy has set up, glue the keel pieces onto the hull. Use body filler to blend the keel and shaft housing into the hull and one another.

Mark the location of the rudder. Drill a hole for the rudder housing and epoxy into place.

Make and install a motor mount according to the power source you have chosen. The mount for the Astro .25 shown in the pictures was made from 1/2-inch flakeboard epoxied into position. *(Since this model was built back in 1980-81, Dynamic has taken on an extensive line of Hectaperm and Dectaperm motors with direct and variable gear drives. Check these in the Dynamic catalog. wcn)* Insure that the motor and the prop shaft are in as near perfect alignment as possible. Although a universal joint will operate in an out-of-alignment condition, there will be a power loss (loss of RPM) in proportion to your misalignment. This is a good time to test run the motor, and check out the sources of any vibrations or other problems that may appear. It is easy to correct these at this stage and not later on when the deck is in position.

Measure two pieces of 3/16 sq. spruce for the chines. Soak them and clamp to the top outside of the hull so they will dry basically in the correct shape. Glue them in place, starting at the stern and following the lines of the hull to approximately 22 inches from the bow, then start curving them up as shown on the plans. Use of a glue like "Super Jet" for this operation will give



TYPICAL WW-II P.T. BOAT (78' LENGTH FULL SCALE - BUILD A 1/2"=1' WORKING SCALE MODEL)

DESIGNED & DRAWN BY ART BAUER - FOR ELECTRIC POWERED R/C OPERATION

SPEED WITH ASTRO 25 - 15 MPH.+
ASTRO 15 - 10 TO 12 MPH.
DUMAS - 6 MPH.

ALL MARINE FITTINGS, - RUDDER ASSEMBLY & FIBREGLASS HULL AVAILABLE FROM: DYNAMIC MODELS
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0" 1" 2" 3" 4" 5" 6" 7" 8" 9" 10" 11" 12"

U.S. BOAT & SHIP MODELER magazine

Plan No: US2091

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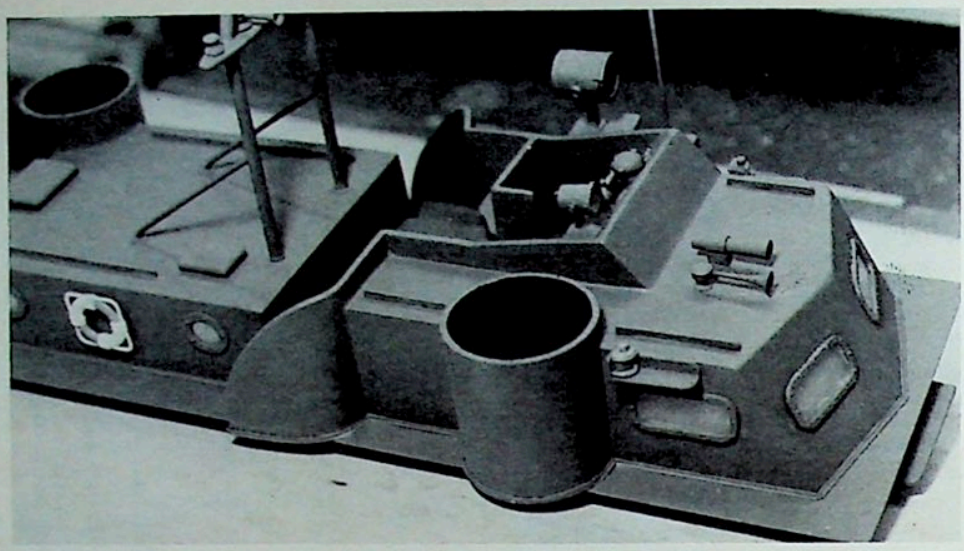
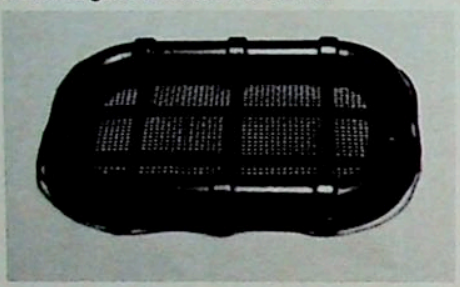
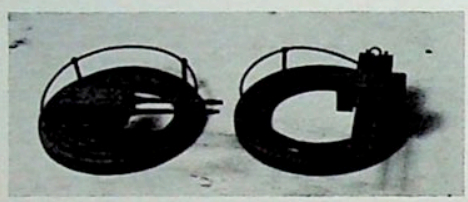
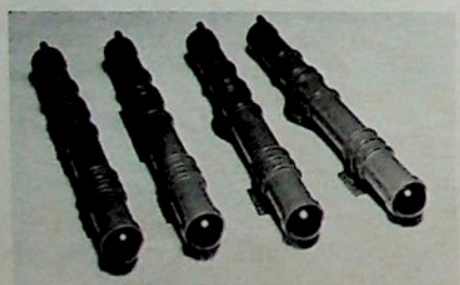


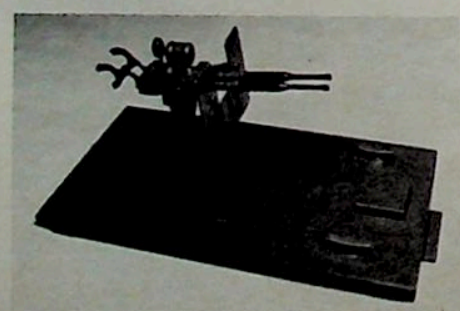
Starboard view of forward superstructure, with detailing and flat Navy gray paint. Still waiting for machine gun contractor to deliver!





Completed machine gun mounts. Guns were salvaged from old plastic airplane kit. Now available from Dynamic Models.





Life raft, torpedo tubes, and 20mm guns made from Dynamic Models kits.

you fast setup time and let you work the strips into position a little at a time. Use body filler to fill in the gaps between the hull and chines and sand to the final shape as shown on the plans.

The rubrails are made from 3/16x1/4 spruce strips prepared in a similar manner to the chines. After the soaking, clamping, and drying, they are glued on even with the top edge of the hull. Fill and sand to shape as shown on the plans. Do not forget that a rubrail also goes on along the stern of the hull.

The main deck framing is covered with six pieces of 1/8 plywood. Why six pieces? There are six straight edges that will come into contact with the superstructure and rear access hatch. The superstructure and rear access hatch frames are built with straight edges. What is easier to cut and fit than straight edges?

The six pieces used to cover the main deck framing consist of the following: from bow to front deck opening, a piece on each side from the front deck opening to the beginning of the rear access hatch opening, a piece on each side from the beginning of the rear access hatch opening to the stern, and a piece across the stern between the other pieces. The outer edges of these pieces should be large enough to overlap the rubrails. Glue the deck pieces on, making sure that the edges of the deck opening are perfectly in line with the deck framing. Fill the joints between the deck pieces and between the rubrails and the deck pieces and sand to shape.

Cover the superstructure and rear access hatch frames with 1/8 plywood fitted to the edges of these frames with one exception. The rear access hatch decking should be extended beyond the frame at the forward end to cover the support between it and the superstructure. The hull is now complete except for final finishing, painting, and the addition of the accessories that will be attached later on in the construction process.

SUPERSTRUCTURE AND ACCESSORIES

With the hull ready for finishing, construction should begin on the superstructure. The rear and middle cabins are nothing more than boxes to which the fittings are added. The front cabin is a little more complex in that two pieces will have to be bent, and some pieces will have to be cut to outlines shown on the plan.

The entire superstructure on our model was built from 1/8 plywood, with the exception of the cabin bases and the gun turrets. The only glue used in the construction of the superstructure and the assembly of the fittings was "Super Jet." Its ability to join dissimilar materials, along with its fast working time, enabled me to move along with the PT construction as fast as I was able to get a piece ready, without waiting for previously glued pieces to set. It really is the modeler's dream glue. The construction sequence that was used was to start with the simplest structure and then go on to the more difficult ones. The rear cabin, the middle cabin, and the front cabin were built in that order.

Cut a piece of plywood to the outlines of the rear cabin top as shown on the plan. Scribe a line 1/4-inch in along the edges of this piece. Cut a piece 1/4-inch balsa to fit inside the scribed lines for the cabin base. Cut strips of plywood to the height of the rear cabin sides and glue them to the edges of the base. Glue the top in place, making sure to leave an 1/8-inch overhang all around.

Cut a piece of plywood for the middle cabin top. On this piece scribe a line 1/8-inch in from the edges, as on this cabin there is no overhang on the roof. Cut the cabin sides to the height shown on the plan less 1/8-inch. Before gluing the sides to the base, drill the holes for your portholes (Note: Many of the WWII PTs had portholes, many had the rectangular windows on the middle cabin. Portholes are available to frame the holes drilled and this is what I used. The choice is yours). Glue the sides to the cabin base, then glue the top in place flush with the sides.

The rear and middle cabins are joined together by the rear turret base and two pieces of armor plate. The rear left corner of the middle cabin and the front left corner ot the rear cabin will have to be cut away to accommodate the 2-1/4 inch tubing used for the turret base. I used Plastruct ABS tubing for the turret bases on my model, cut to the height shown on the plan. Using the tubing for a template, mark and cut out the areas of the cabins that the turret base will be glued to. Making sure that the cabins are correctly aligned, glue the turret base to the cabins. Cut out pieces of plywood for the armor plates

Continued on page 42

PARMA

Makes Some Waves

SPECS:

LENGTH: 25″
BEAM: 8½″
SURFACE DRIVE
FLEX CABLE DRIVE
6 CELL BATTERY
SINGLE MOTOR

SKI TIGER

Parma's New Ski Tiger kits define the term "fast electric" boats. A modified vee-hull design has been coupled with the latest surface-drive technology to produce a truly explosive performance package! The rugged, vacuum-formed, ABS plastic kits are available in basic, deluxe, and supreme versions. Also available separately; all four hull components in durable, paintable lexan! Get out of "dry dock" and make some waves of your own with the fast, easy to assemble **Parma Ski Tiger!**

SPECS:

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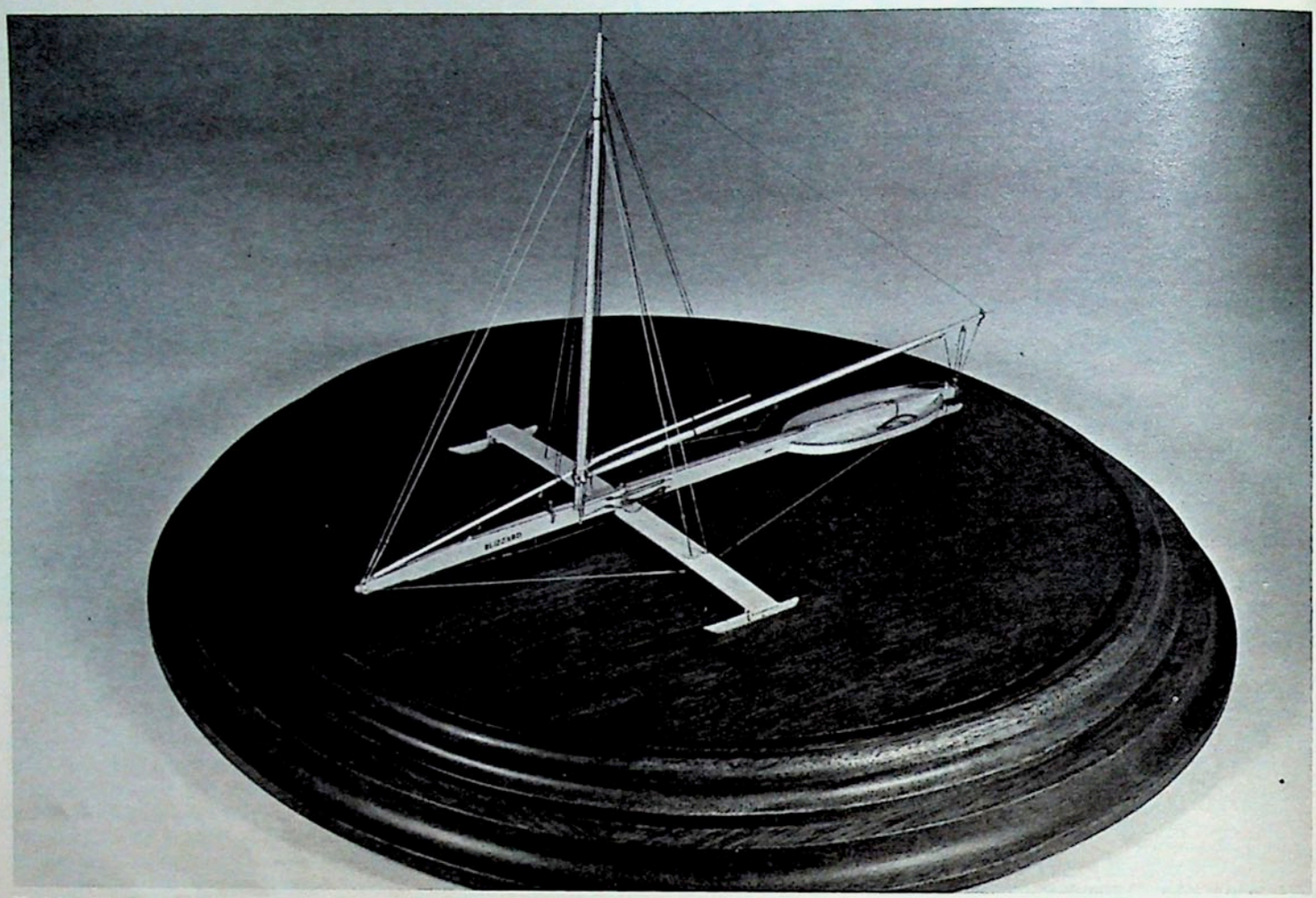


Model by Rob Napier of "Blizzard," champion ice yacht from Burlington, VT. Was second largest in the Excelsior Ice Yacht Club fleet in 1901. Averaged 48 mph in a 20-mile race, triangular course. Plank-on-frame or solid model? What's fair? Photo above and below by Rob Napier.

The MODEL SHIPWRIGHT

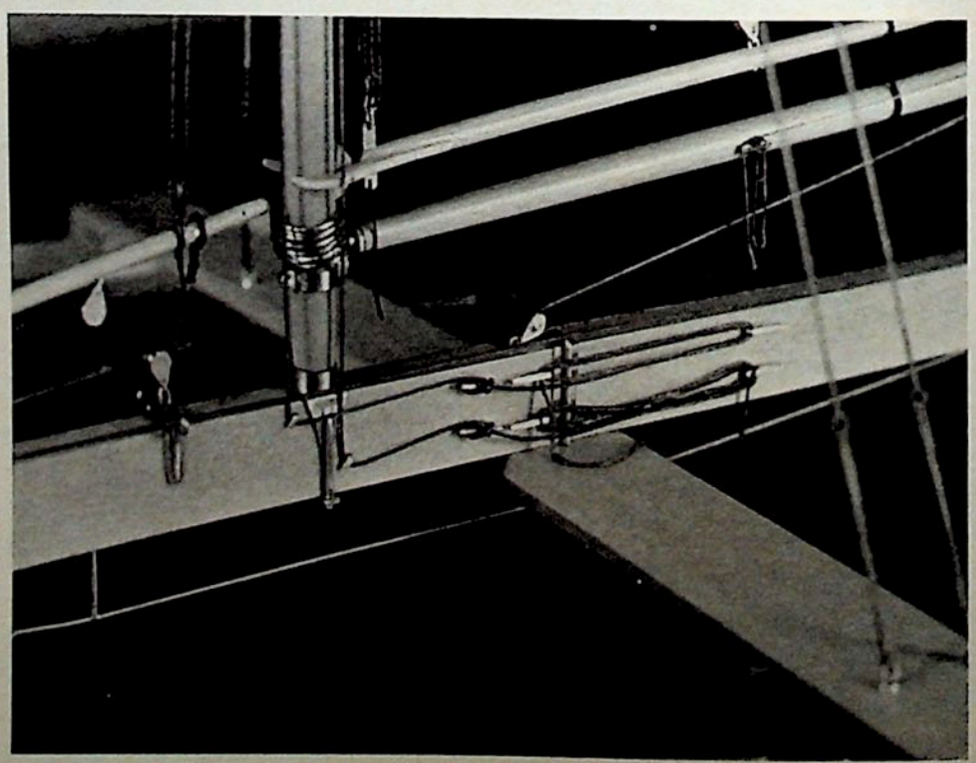
By PETER SORLIEN . . . Our columnist sticks his neck out to deal with a subject that is guaranteed to keep scale model boat builders talking . . . and talking . . . and talking. Send us your comments.

Remember Paris? The man who, forced to award the golden Apple of Discord to the most beautiful of three goddesses, chose the Goddess of Love, and Helen? Helen of Troy, that is, and you do remember how much trouble that infatuation started.? It cost poor Paris his life.

Think of Paris the next time you enter a model in competition, or visit a show and second-guess the judge. Believe me, the judges think about him.

In a good show, when competition is keen and there is more than one goddess of a model, a judge can feel just as subjective and helpless as Paris. Fortunately, most competitions now have stated criteria to balance the tug on the judge's heartstrings, and give him company.

These criteria become important matters, and not just for the judges peace of mind. In proportion to the seriousness with which the competition is regarded by modelers, the criteria will



Close-up of mast step and runner plank of Blizzard, 1/48 scale. Woodwork is boxwood, brass hardware, silk rigging. Note life-like draping of lines, choice of textures, finish.

guide their endeavors and shape the field. Conversely, they also are a major factor in how seriously modelers will take the competition.

Several systems of criteria have been tried in different competitions. After judging ship models by a number of them, I propose that some rethinking is in order.

THE GOALS OF COMPETITION

Ship model competitions do not identify the best model. If that were the goal, the organizational effort would be better spent on a pilgrimage to the Admiralty models at Britain's National Maritime Museum or the Gibbs & Cox models at the U.S. Navy Museum.

Then we organize ship model competitions to recognize outstanding modelers, don't we? Not exactly, and besides, Webster's definition of "outstanding" was not written with ship models in mind. The rules of ship model competition are forging the definition. Consensus among modelers about the meaning of "outstanding," the criteria for judging, is essential for the judge to be "fair."

Competition is about people, however, and encouraging them to make more and better models. One way is to set up standards they can shoot for, and another is to recognize worthwhile effort. Another is to recognize significant accomplishment in models which still may be fatally flawed.

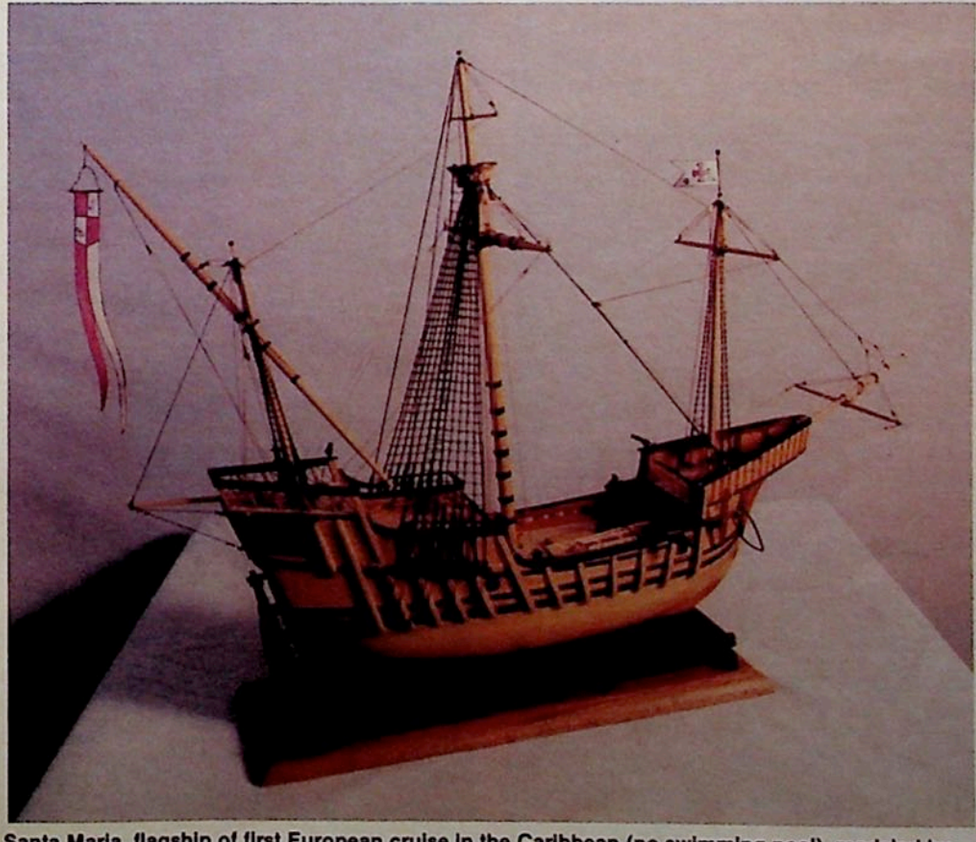
The standards most organizing committees will want probably include a high level of finish, painstaking neatness, and use of techniques which will give models a long life; call these good craftsmanship. The great variety of ship modeling forces some subdivision beyond this, or the judges will be comparing apples with oranges, skiffs with battleships.

It is usually desirable to encourage promising modelers at all levels of ability, too. Lots of awards for the judges to bestow are helpful, but even more so are clear criteria, so everyone will understand what must be done to move up in the next competition.

Much more can be accomplished. Competition rules can recognize accuracy and depth of historical research, and can encourage investigation of new subjects. They can reward creativity; looking for ways a ship model can be more than a three-dimensional blueprint.

As ship modeling matures and modelers are seeking new challenges, ship models even approach an art form. A great variety of presentations... solid hull or cutaway construction, painted or bright finish, upright or heeled, sails or no... is already common. When the modeler gains control of his colors, be it a palette of paints or of woods, he controls atmosphere, the impression his model makes.

All the thousands of decisions he makes can be put to similar expressive ends, giving his model an emotional and anecdotal content, possibly making it a symbol of the social and historic context in which the ship existed. Yet few competitions give much recognition to these possibilities, even though this is clearly the direction many static display and radio control modelers are heading.



Santa Maria, flagship of first European cruise in the Caribbean (no swimming pool), modeled by Edward "Bud" Millen in 472 hours. Used German plans (could be as good as any, as no one really knows). Won First Prize in competition where research was not a criterion. Miller pic.

A Mediterranean Caravel, built to approx. 1/96 (1/8":1') scale by Charles Browne. Intended only to represent a typical 15th century vessel, it's based on a drawing published in Time-Life's *Great Age of Sail*. Its antique "atmosphere" won it an Honorable Mention in 1989 USS Constitution Ship Model Guild competition, Boston. Browne photo.

RECENT EXPERIENCE

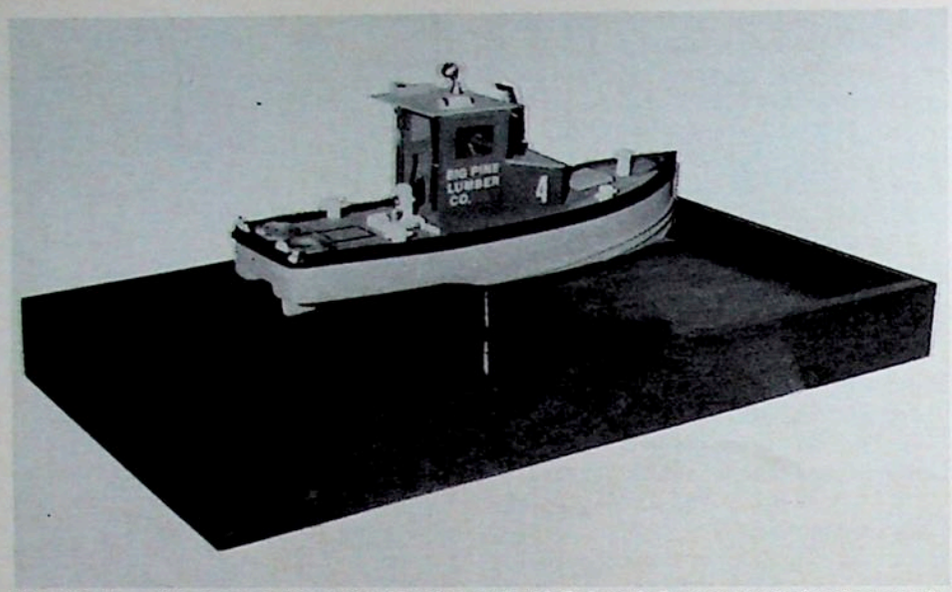
In February I was honored to judge the annual competition sponsored by the *USS Constitution* Ship Model Guild in Boston, along with a prominent dealer of ship models, and a museum curator with many models in his care. I am an appraiser of ship models and art.

The rules were fairly typical for club competitions... and the models which were entered strained them. The club has appointed a committee to consider revisions.

The basic provision of the *USS Constitution* rules is that all entries must be handbuilt, and be entered in the name of the builder. Models which won an award in previous years may be exhibited, but are not eligible for judging.

The first division of entries is between those built from scratch, and those built from kits. Naturally, some of the scratch entries bore commercially produced castings and machined parts, and some of the kits were so much better than the manufacturer intended that he should be embarrassed (but probably would claim credit instead).

The entries were divided further according to method of hull construction: plank on frame, plank on bulkhead or carved from solid. Thus six categories were created; a seventh was added for ships in bottles and an eighth "Open" category became a catchall. First, Second, and Third Prizes were awarded in



Cute little log rafting tug won Honorable Mention against full-rigged clippers, mostly for charm and uniqueness. Builder Paul Stankard saw one in movie about logging in Pacific Northwest, starring Paul Newman and Henry Fonda. Obtained plans offered to model railroaders by the McKenzie Iron Company. Stankard photo.

each category which was large enough, plus a Best of Show, and Honorable Mentions.

The judges were given four criteria, with their relative importance fixed by ceilings on the points awarded:

Choice and use of materials . . 37%
Extent of detail 27%
Finish 18%
Scale and accuracy 18%

These rules are clear and simple; here's how they actually worked out.

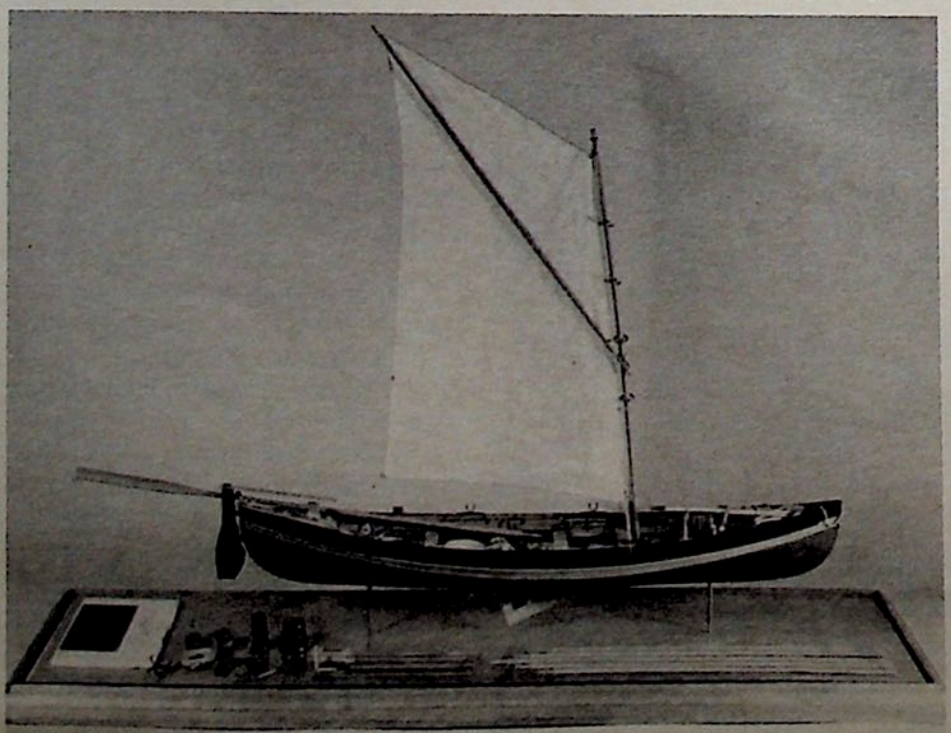
The *Constitution* Guild is large and healthy, meaning it includes beginners and professionals; but professionals rarely bother with kits, and beginners are usually daunted by plank-on-frames. The majority of entries in the kit categories were made by beginners and more advanced amateurs; the majority of the scratch models were entered by aspiring and advanced amateurs and professionals. A de facto division by skill occurred, creating an opportunity to encourage less advanced modelers.

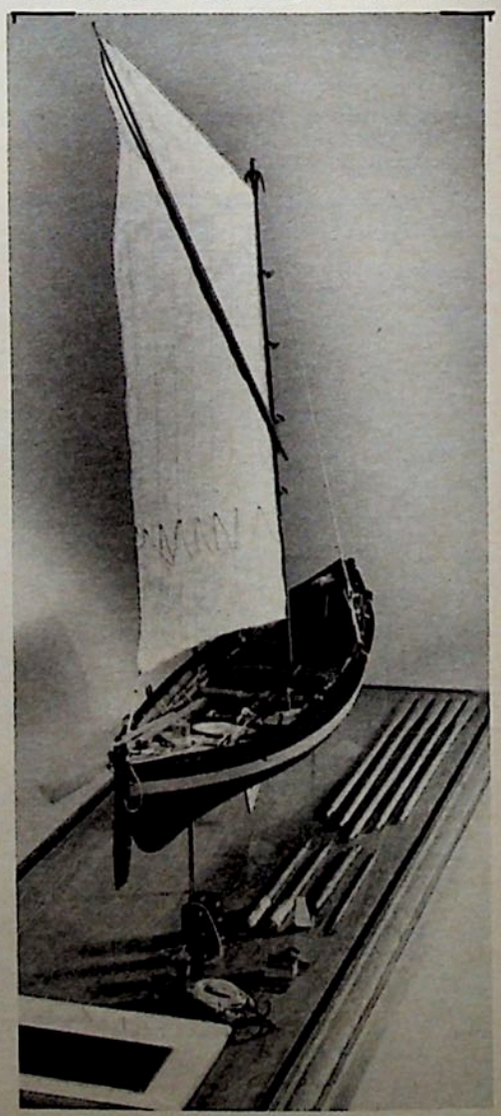
The second effect of this natural orientation was insufficient entries in the Plank-on Frame Kit category: it was dropped, and the entry lumped with the Open class. Another category, Solid Scratch, was overwhelmed, with more than double the entries of any other category: it was the arena for the competition's real brain-teaser.

The best way to make a point is with a good example. Rob Napier made his criticism of the rules very quietly with a superb example . . . a 1/48 (1/4 inch : 1 foot) model of the Ice Yacht *Blizzard*. At 42.6 feet long x 25.0 feet wide, with 634 square feet of sail, *Blizzard* was the second largest iceboat in Burlington, Vermont, in 1901, and won a lot of races. Napier reconstructed her in every last detail (except for threading bolts and turnbuckles), but her "hull" was a long solid beam! So she was classified as solid, even though she was more faithful to original construction than many of the plank-on-frame entries.

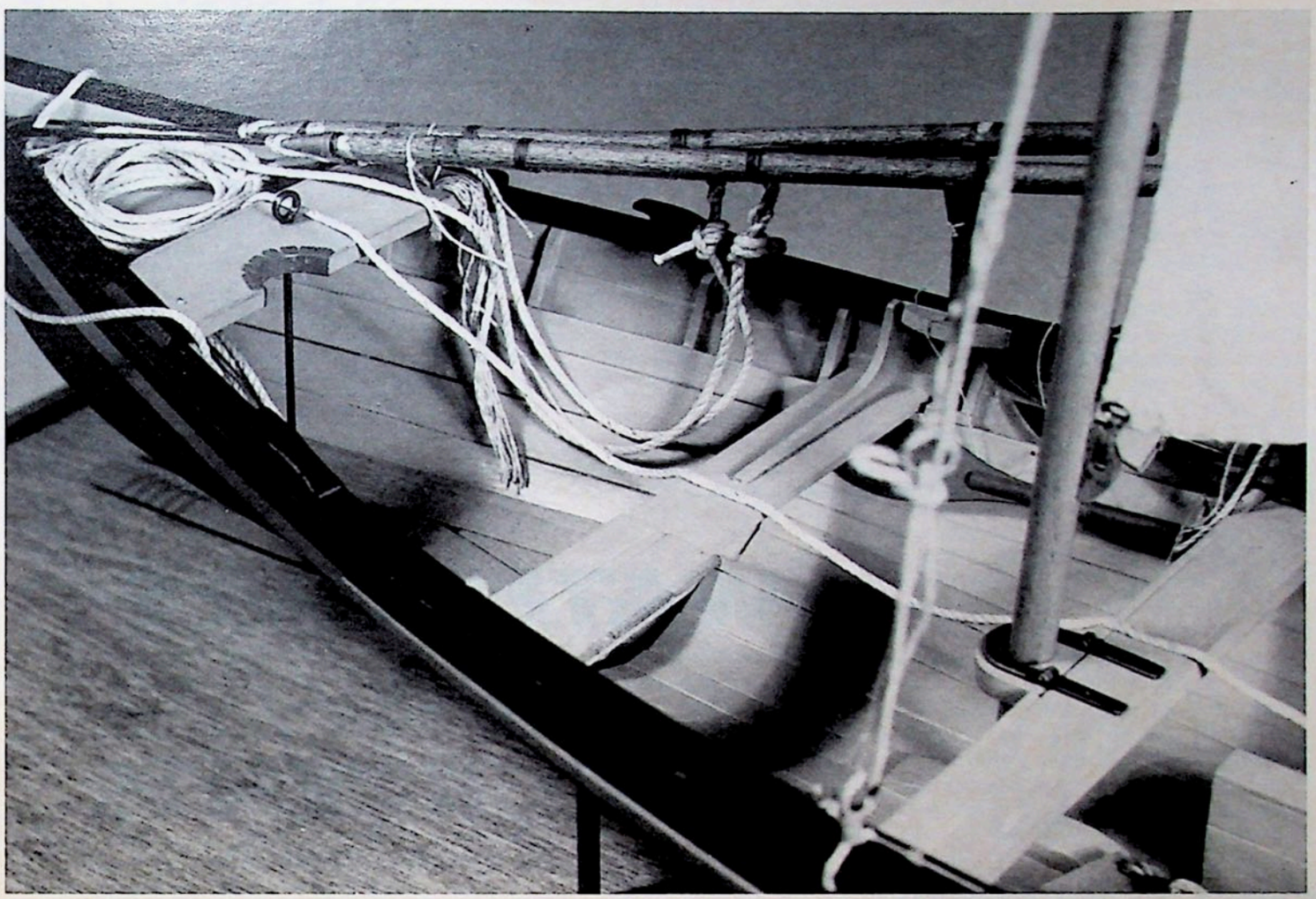
I must confess that we judges took advantage of Napier's tweaking our collective nose. The competition for First Prize in Scratch Plank-on-Frame was hot; the winner would edge out models clearly better than first place winners in other categories. Leaving *Blizzard* in Scratch Solid meant that at least we had two Firsts to bestow on the best models.

Fortunately, another of th top models was in the Open category: a 41-inch model of the British harbor tug *IMARA*. Louis Hills, her builder, began with the elaborate kit for radio control sold by Calder Craft of England. He remade all the wooden parts of the kit,





Erik Ronnberg's superb plans for a Delano whaleboat brought into convincing life by Arthur Herrick, won First Place, Plank-On-Frame in USS Constitution Ship Model Guild competition, Boston. None of gear is fastened down, all rigging operable, so display can be rearranged at will. A retired professional model builder, Mr. Herrick spent 1363 hours on this one. Herrick photos.



Up forward and close in aboard Arthur Herrick's Delano whaleboat model. No filler was used in any joints, as it tends to bleed through paint over the years. Note operable hinge for mast step, beading along edges of thwart, and scale texture of hickory harpoon poles (maple on the model). Photo by Herrick.

adding and modifying details according to photographs taken during sea trials. Twin screws give her handling like a real tug, and with a sound system simulating the whistle, the horn, and the "chuff" of the steam exhaust (which is synchronized with motor speed), she looks and sounds like one. If not for her radio-control systems, she would have won Plank-on-Frame Kit (had the category not been eliminated).

Another radio-controlled model was entered in Open, a racing catamaran which could do 50 knots. Her builder, Robert Prezioso, was interested primarily in making it go, and though he had finished it beautifully, he included only the most basic details. It made me wish there were some opportunity for demonstration.

Still, Lou Hills made it clear that a radio controlled model could hold its own in a static display competition; in fact, he told me that the Best of Show model in last year's *Constitution* competition was also radio controlled. Without a label, we judges couldn't tell.

Another fine model presented a similar problem. A *Santa Maria* built by Edward (Bud) Millen had been classified Scratch Plank-on-Frame, but we noticed a label in the case describing plank-on-bulkhead construction. With a sigh of relief, we judges transferred it, and gave another First Prize to one of the hot competitors in Plank-on-Frame. These models left me wondering about the value of classifying by characteristics not visible.

What remained in Plank-on-Frame was still vexing. Another could be winnowed out with the Best of Show award, but we still had a professional pitted against an amateur. That may be healthy, but obviously the professional has more opportunity to perfect his skills and build his research network, and he probably is better equipped. The amateur has the advantage of unlimited time to lavish on his model and.... admit it....a slight psychological advantage....the feeling that he will respond more to the encouragement an award represents.

Sure enough, the Best of Show went to a 1/8 (1-1/2 inches : 1 foot) model of a Herreshoff sailing dinghy on which Christopher Morrison had spend more than two years, and still wasn't finished. We could find only two respects in which Morrison's model differed from the original: he had riveted planking to the frame instead of screwing it, a structural necessity; and when he screwed the brass sockets for oarlocks to the gunwales, he had forgotten to align the slots in the screws fore-and-aft!

The winner of First Place in Scratch Plank-on-Frame was a Delano whaleboat built to Erik Ronnberg's plans by Arthur Herrick. Mr. Herrick retired from Atkins & Merrill some years ago, but still builds a fine model. This one was at 1/16 (3/4 inch : 1 foot).

In addition to the problems raised by these examples, the judges chafed under a list of important qualities they could not consider under the rules. Attention to techniques which ensure a reasonable life for the model was not a criterion, for example. Four models entered were well crafted and researched, but built entirely of foam and styrene; one less than three years old was hopelessly warped, and none were as fair as originally built.

A good presentation of the model was not recognized, nor was there any encouragement to be creative. The aesthetic and expressive possibilities of ship modeling were not even men-

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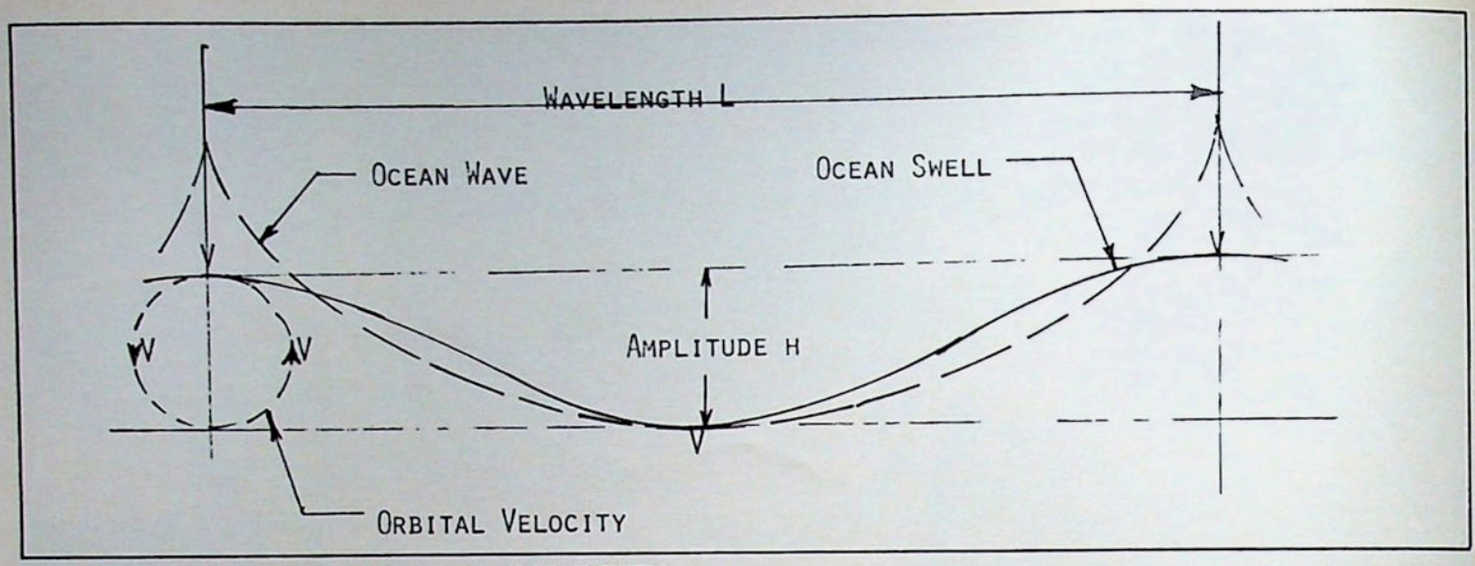
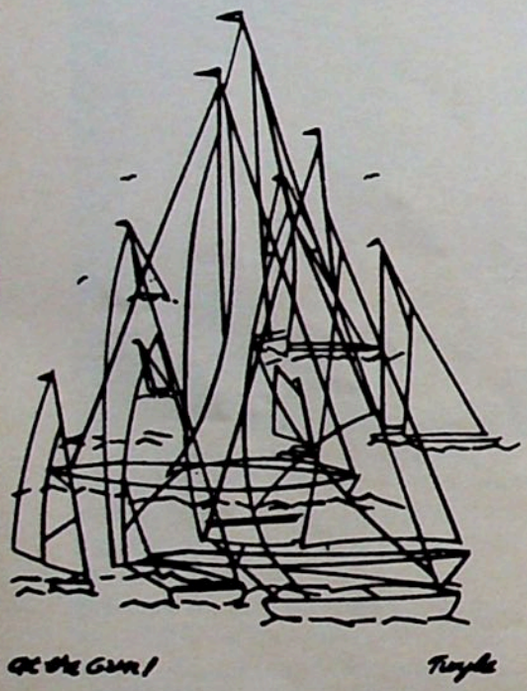


FIG. 1. COMPARISON OF OCEAN WAVE AND OCEAN SWELL.



WATERLINES & CURRENTS

By FRED LEHMBERG

It is probable that many of us have had the opportunity to stand on a beach and watch with awe the approach of a great ocean wave as it builds higher and higher until the top leans forward and crashes with a resounding roar into a mass of white froth that sweeps at us and reaches for our toes. We dance backward, safely removed from the ocean's reaching finger! A few waves later, some people say seven, another giant approaches and tries to get us again! Failing once more, it withdraws with seeming chagrin in the undertow of the following wave. Once a giant roller, it is digested by that wave, along with whatever beach debris. . . shell fragments, weed and grains of sand that rolls along with it. This debris will be returned by the next Crasher and may eventually be left there at high tide!

Reading the above I thought of "flotsam and jetsam." The great majority of the times these words are used, they are used in error! Flotsam is actually floating debris from a wrecked ship or articles of its cargo that have been released because of the ship breaking up. Jetsam are floating articles that have been thrown overboard from the ship in an effort to save the ship or the articles. Flotsam and jetsam are separated in marine law for salvage reasons. Too bad, for watching the graceful motion of a sea weed in the surf is of greater satisfaction if one is watching "flotsam and jetsam" instead of debris or trash!

A sound wave is called a longitudinal wave. In this kind of wave, the vibrating particles move back and forth in the direction of the energy flow. Energy may be transmitted in all states of matter, be it solid, liquid or gas, by longitudinal waves. The wave velocity is defined as the product of frequency and wavelength for longitudinal waves.

The other kind of wave is called transverse. In this type of wave, energy is propagated at right angles to the direction of vibration. When you stretch a string between two doorknobs and "twang" it, a wave motion is detected traveling back and forth, a given point in the string rising up and down, but the wave moves back and forth and passes the energy accordingly. We generally state that only in a solid can energy be transmitted by a transverse wave, but then light comes along to prove the statement wrong, for light can be polarized, indicating it has certain transverse characteristics and is transmitted by both types of waves.

An ocean wave has a further stipulation besides also being apparently transmitted by both transverse and longitudinal particle movement. This energy is transmitted at the interface, or boundary, between fluids of different densities, bringing gravity into the picture! Thus, the energy is transmitted at the surface interface and at a very definite "thickness" of this interface. Looking at Figure 1 you will see an ocean wave having a wavelength **L** (distance between crests), and a height or amplitude **h** (the distance from the wave through to its crest). An ocean swell is a cosine wave transmitting energy from a distant disturbance, perhaps a storm far, far away that has died! Ocean waves are caused by winds and may build or fade as the winds shift and decay and are noted by their sharp, often breaking, crests. Sometimes they become swells.

The energy at any instant represented in each of the two waves is essentially equal. If there were no friction, the swell would go on forever with its

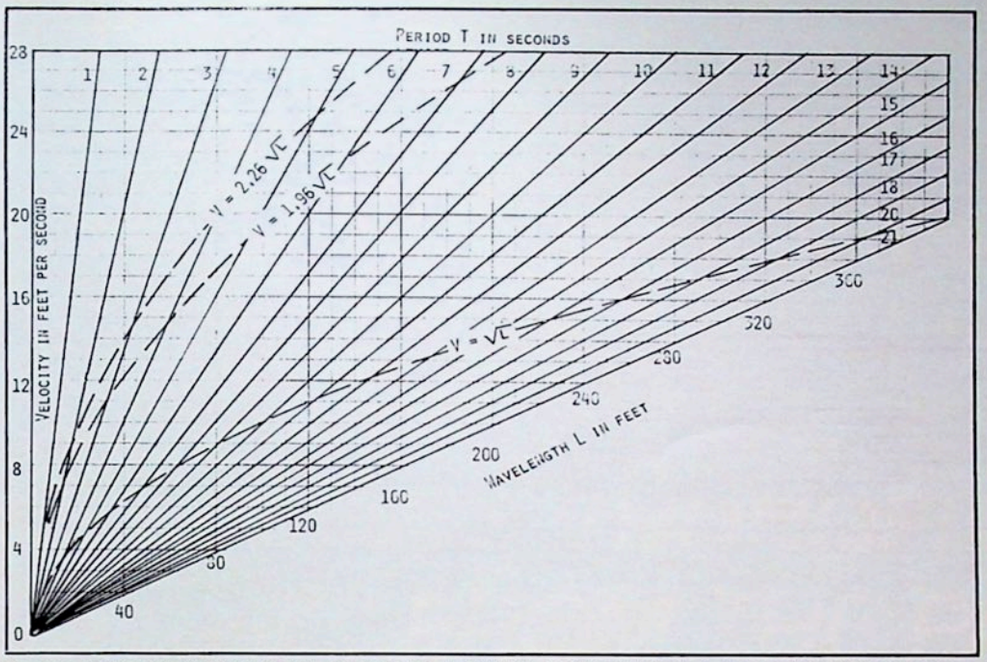


FIG. 2. MAXIMUM WAVE VELOCITY AS A FUNCTION OF PERIOD AND WAVELENGTH.

gravitational "spring constant'. At a given instant, the energy of each particle of water is equal to its weight times its datum height. The wind "stacks" water on the windward side of the wave, making it steeper until it falls forward. This happens when the crested wave has gained an excess of energy over that of the original swell, the allowable excess difficult to assess. As Bert Lahr would have put it, "Water waves is the funniest people!"

There are some other interesting things about waves. Several weeks ago a friend of mine named Willie and I checked out a big yellow balloon. We were towed out to sea by another friend with an outboard on an absolutely lovely morning. Our boating friend set an anchor for us not far from a nun (a red channel buoy used in navigation), and left us to fish. Nothing at all was biting, so we watched the waves passing beneath us. They were pretty good sized ones, too! Ever the observer, I noticed that five seconds elapsed between wave crests passing beneath our basket. This is the period of a wave. The frequency of these waves is 1/5, or 2 waves per second. Since velocity equals frequency times wavelength for both ocean waves and swells, we could calculate its velocity if we knew its wavelength. I commented something to this effect as an aside to Willie, who said if we would divide the distance to the nun by the time a wave passed from us to the nun we should have the velocity. I got a little short, I guess, about how were we to get *that* distance, because Willie pulled one of those Edmund Scientific range finders out of the pouch with a hurt expression, tweaked it and pronounced the nun to be 420 feet away!

Now, hold on! Don't get any ideas that Willie is "funny" because of the pouch or that it happened to have a range finder in it! Willie is short for Wilberta, and she is a female kangaroo (wallaby, to be correct) that jumped ship from the Australian Olympic Broad Jump Team when the games were held at LA. Being a girleroo, she has a pouch which she uses like a duffel-bag, gadget bag, weekender bag. . .whatever. Believe me, something like this could easily happen to anyone who might be fishing from an anchored yellow balloon in the Pacific Ocean with a female kangaroo (wallaby, actually) for company. *Really*, people who jump to conclusions like that. . .

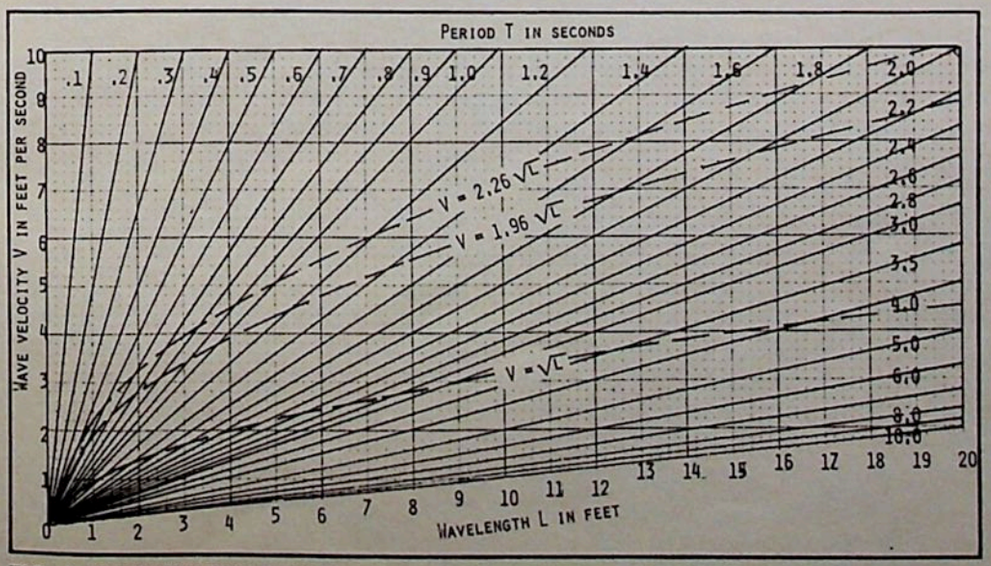


FIG. 3. MAXIMUM WAVE SMALL WAVES OF PERIOD T AND WAVELENGTH L.

It took 21 seconds flat for a wave to traverse the 420 feet, which gives a velocity of 20 feet per second. Since we had determined the frequency of the waves to be 2 per second, which is a period of 1/f ^{5} 5 seconds, we could calculate the wavelength! Using the old velocity equals wavelength divided by the period formula, and plugging in these numbers, we solved for wavelength, which turned out to be 100 feet! You know, perhaps this was the way the wave formula was discovered?

Our outboard friend not yet in sight and still no bites, we wave-watched some more and noticed several things. We really knew what a wave crest looked like when it passed the anchor rode at 20-feet per second! We joked a bit, pretending the waves were actually not moving and that the anchor rode and our balloon were dashing across the water at 20 feet per second! As the rode cut through the crest of the wave it had a nice "bone in its teeth" or bow wave!

I don't know which of us saw it first, perhaps at the same time, but the bow wave appeared on the back of the rode! It grew less, disappeared, and then appeared again, properly, as the rode dashed along at 20-feet per second! When it next appeared to be moving in reverse, we noticed it appeared to be near the wave trough. . .at wavelength center! Up on either flank of a wave there was a position where it seemed not to move at all! Was this a phenomenon associated with the traverse *and* longitudinal movements of wave particles?

Our friend arrived, took in the anchor and towed us back home where Willie treated us all to some frothy examples of Oz's Best. She owns a spa specializing in Australian Beer and Ale. She calls it "Wallaby Willie's Long Jump Saloon."

The next day I browsed among the bookshelves to find an explanation of what we had observed from the balloon. It was an interesting session!

An English engineer, Naval Architect and scholar, William Froude, had done some marvelous work in the study of waves and the prediction of a ship's per-

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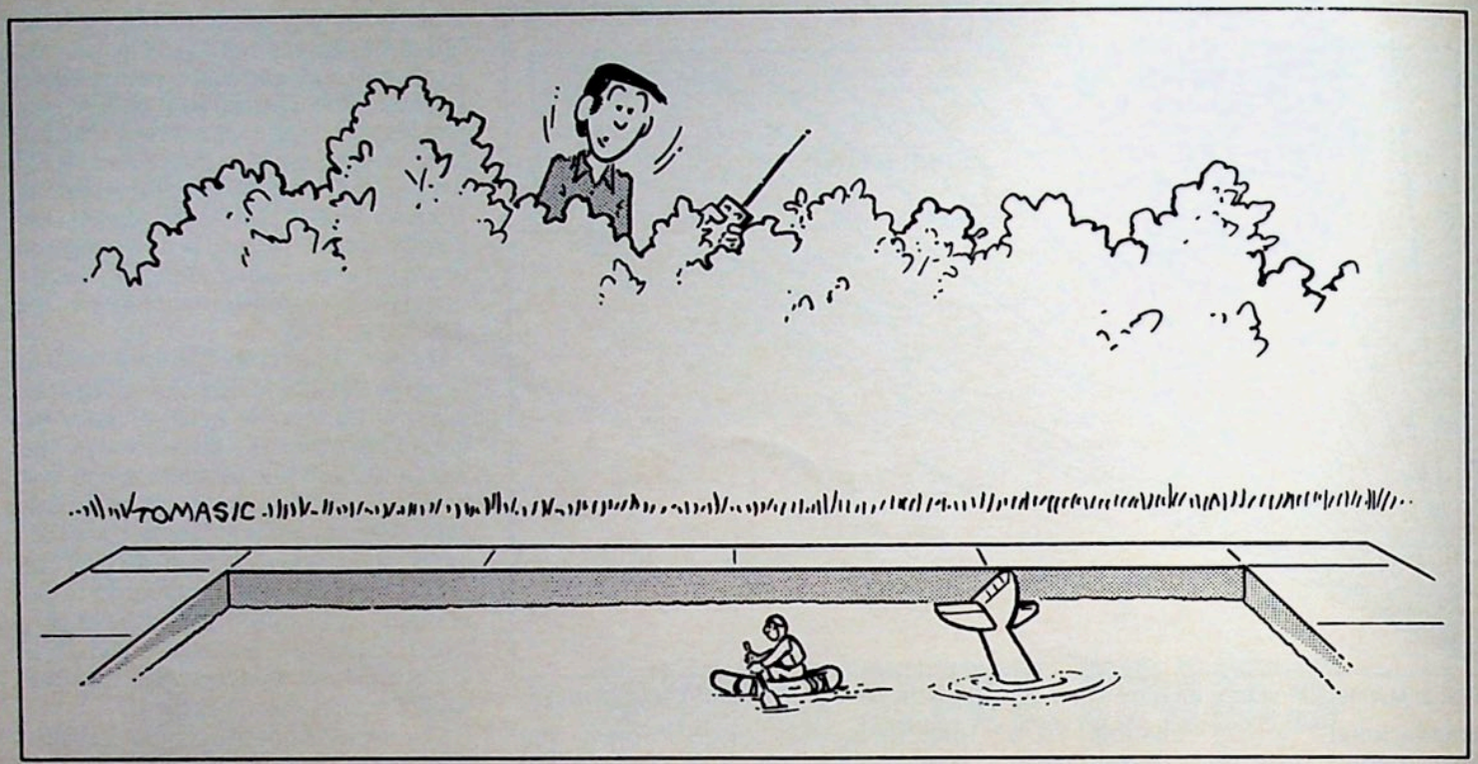

"Wow, sure glad I brought along the surface frequency radio. You never can tell when there'll be an emergency!"

INDUSTRY "SCUTTLEBUTT"

By RALPH WARNER . . .

A walk around any well-stocked hobby shop will provide an amazing array of attractively packaged kits and ready-to-run boats. What we are really looking at is the evolution that has taken place over the years in the model industry. We are now benefiting from years of development and investment that has been made by many companies. It must be noted that the application of new materials and methods was seen in airplanes as well as in boat models.

In the beginning, there was wood. Just as most early model plane kits consisted mainly of wood components, so did the model boat kits. The early ones were crude. Occasionally, you may have a chance to see one at the swap shops common at the bigger R/C shows. There was usually a block of wood from which the hull could be carved. Detailed drawings directed the modeler to carve off anything that did not look like the proposed model! Deluxe kits would have the hull roughly machine carved to shape. . .very roughly! Any hobbyist who could build a representative model from the kit had a good reason to look at the finished product with pride. He had truly built a model.

We oldtimers recall that when "balsa went to war" in the early 1940's, there were various other materials used, harder woods, and hulls molded from what appeared to be sawdust mixed with glue to form a moldable paste. There was still a great deal of cutting to shape.

The gas engine powered models of the era were constructed miniatures of the full scale versions, with keels, bulkheads, planking, etc. All of the above were basic and only dedicated craftsman could build truly attractive models.

The miracles started to happen in the late 1940's when the first "plastic" models became available. They weren't necessarily as we know them today. Bakelite was a common material. Ask your grandfather if you don't know about that one. The early 1950's saw the first of the true injection molded, styrene plastic models. It was believed these would quickly revolutionize the model industry, and as you know, they did.

An injection mold is basically a metal cavity into which melted plastic is pumped, and when filled, allowed to cool and harden. Then the mold is opened to allow the removal of the newly shaped part, and the process repeated. That is probably the simplest description of a very complicated and expensive process that you will ever read. Just think of the engineering and careful processing it takes to get the intricate shape from a block of steel. It is necessary to sell a great number of units to pay for the cost of development and production.

The market filled rather quickly with scale display models. None were adaptable to the early radio equipment which was physically large and usually required many batteries. But late in the 1950s, Marx, the toy manufacturer, brought out its famous Chris Craft Constellation, which really proved what could be done with this type of construction. The molds are still used today by Lindberg with its successful scale and R/C version. Unfortunately, not much else was done to this standard although some of the other manufacturers were starting to include injection plastic fittings. Cox and a few other companies started to produce injection molded free running or tether boats to compliment their airplane lines. But none of these were really adaptable for R/C.

Most of the R/C boat models that came onto the market at that time were of wooden construction. They did start to reflect the "prefab" construction techniques seen in airplane kits. Parts were die or saw cut as was true of the early Dumas kits. Ideal Models had a line of scale kits whose hulls were preglued and assembled of balsa sheet wood. Sterling developed the largest

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The Pay-N-Pak unlimited hydro has a blistering history of racing excellence that will thrill you at the throttle. After racing as Pay-N-Pak, she became the Atlas Van Lines U-76, then finished her distinguished career as the Miss Madison. And now you can take this 1/8 scale hydro to the races and win!

She's 43" long with a 22" beam and takes a .67 engine. Pay-N-Pak

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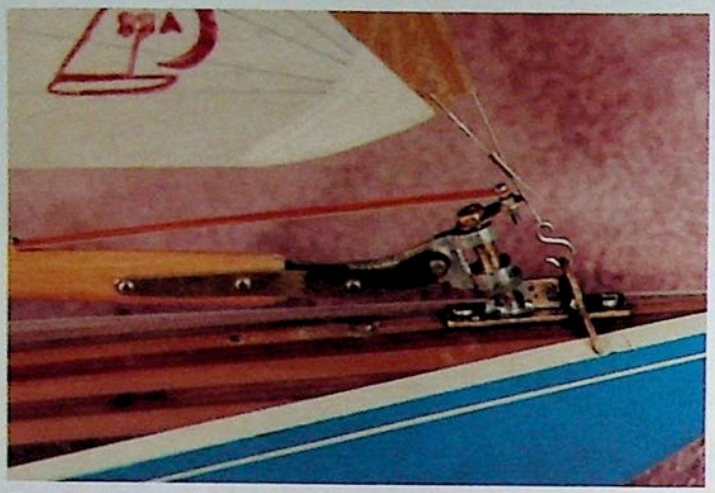


Fig. 4. Jib fitting on author's EC/12.

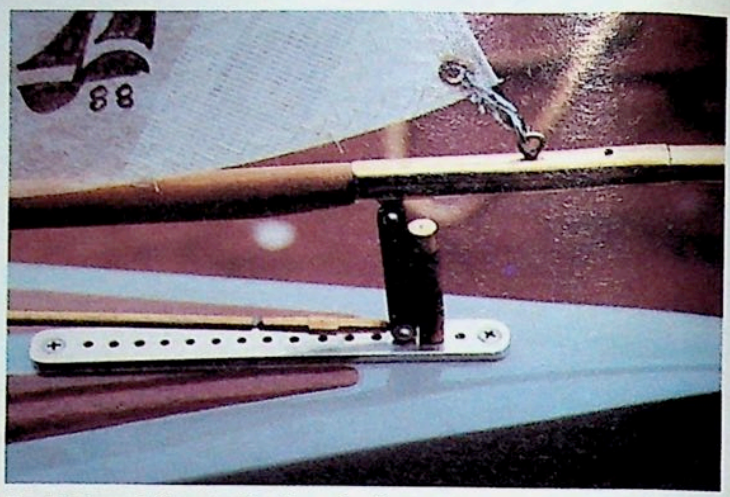


Fig. 5. Vanged jib swivel by Tom Jordin.

STRICTLY SAIL

By ROD CARR

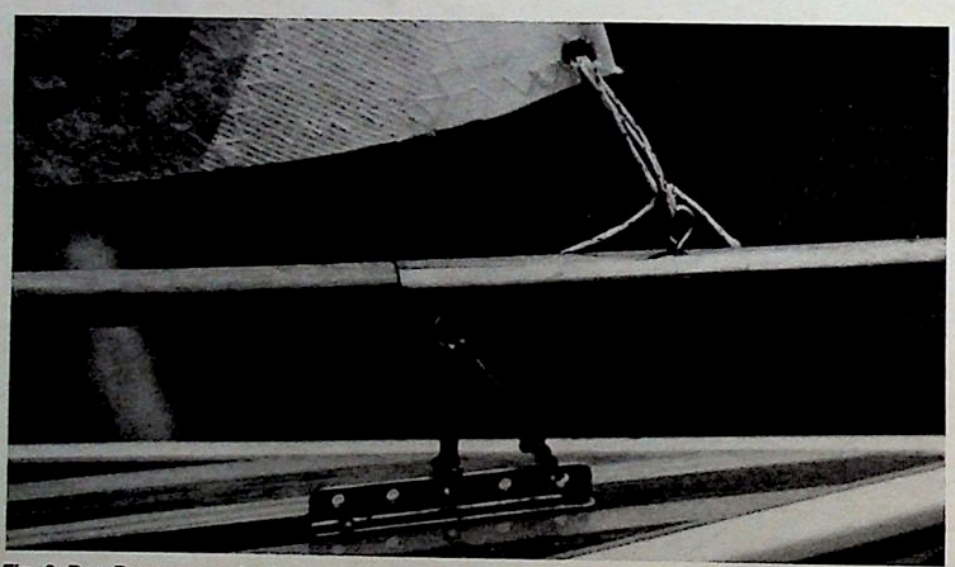


Fig. 6. Ron Banner uses both counterbalance and interesting swivel.

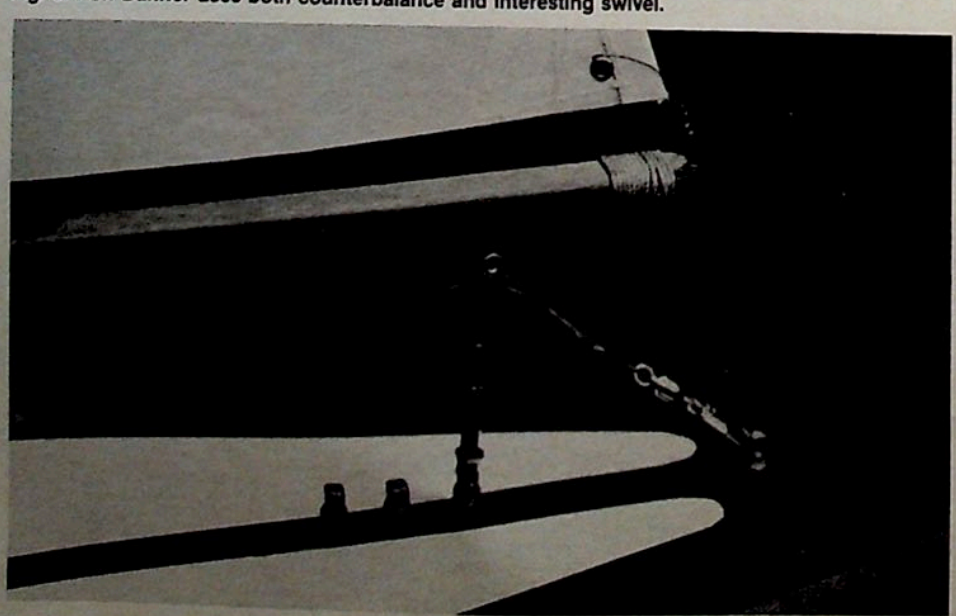
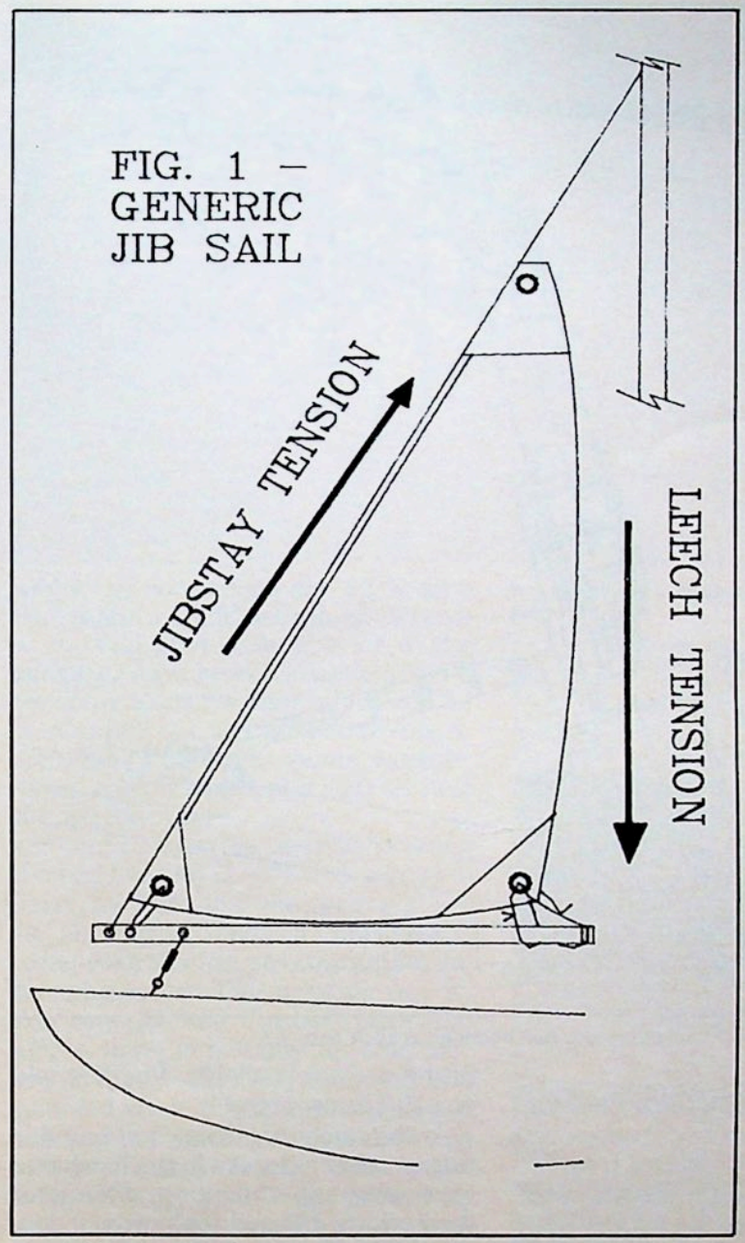


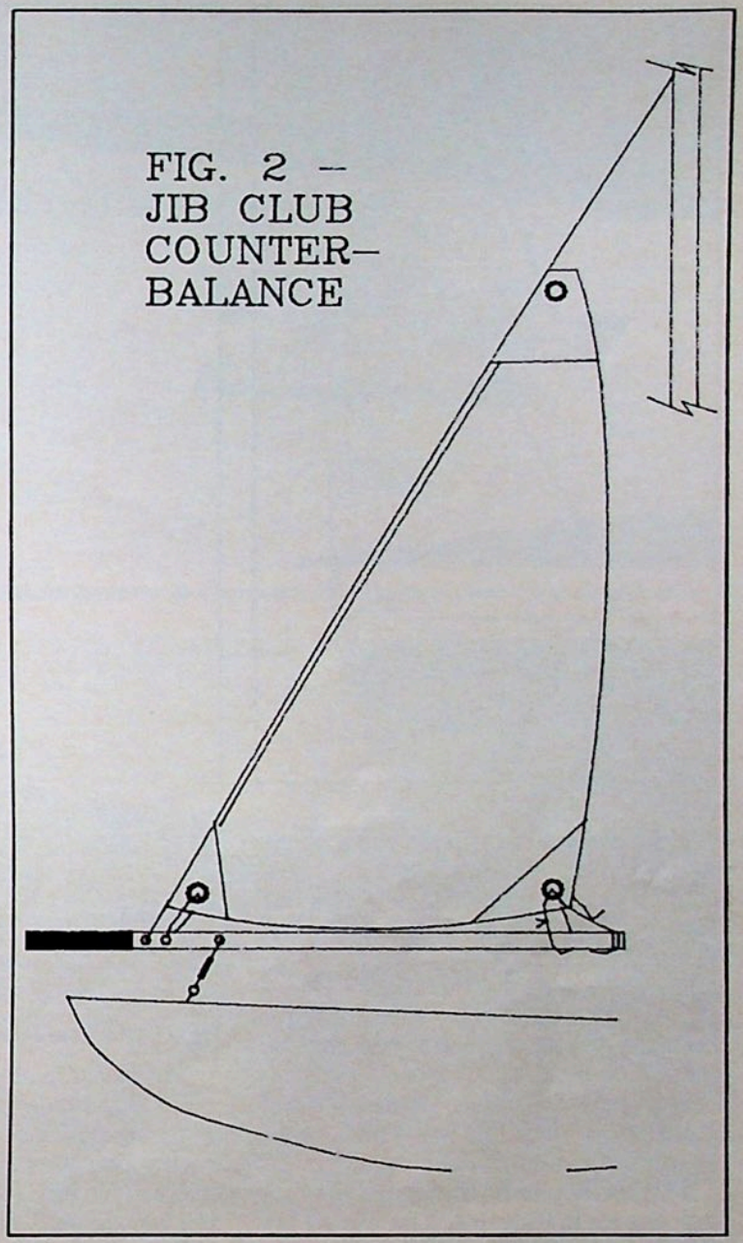
Fig. 7. Warren Slauson has an idea or two also.

In our last article we discussed the configuration and functional relationships which make up the jib. We focused on what the different parts of the sail do, and what needs to be controlled. This month we will center on how to make the sail do what you want it to, and what kinds of fittings are available to provide the control on that important sail that rides your boat "before the mast".

The beginning skipper is prone to build an "offset" jib swivel arrangement. One of the earliest observations a skipper is likely to make about this jib swiveling arrangement is that the force which is pulling up on the forward end of the jib stay (necessary to keep the jibstay straight so the sail will set properly on it) has its direction reversed by the jib swivel and turns into a force which is pulling down on the jib clew, thereby tightening the jib leech (Figure 1) The jib club must have some kind of downward force, or else when sailing on a reach or run, the club will lift and spill all the wind from the sail. Now at any given time, this leech tightening may be just right for the conditions experienced. But often we observe that as the boat goes downwind in a period of lighter air, the leech tension prevents the jib from swinging out. The tension on the leech (with no assistance from the jib sheet) simply does its best to return the jib club and the sail to the centerline of the boat. What is required is some sort of a balancing force to prevent this excess force from continually returning the jib club to the centerline. Two popular methods are often seen.

The first is a simple counterbalance weight which is attached to the jib club forward of the swivel point (Figure 2). Usually this is a hollow tube of some sort and the outer end is filled with lead. This arrangement appears at first to be the answer to our prayers. It does help keep the jib stay tight; in fact it tightens it a bit more and it does offset the tight-





ness of the leech. Some carefully built counterbalances have means to adjust the amount of weight or its position along the jib club extension (I believe that would potentially have ramifications in classes where the rules state that ballast cannot be moved or added once a regatta starts).

As with any non-R/C controlled adjustment, the weight must be picked for the prevailing wind. In light airs it may be too heavy and allow the jib club to lift on the reaches, spilling wind. The other problem is that one has potentially put an outrigger way out in front of the boat if used in some classes, and it can act as a wonderful snag for catching the rigging of other boats. In choppy water, it has the ability to make a boat pitch more, as that weight is out there swinging up and down with each wave.

But having said all that, do they really work? Well, the last three EC/12 National Championships have been won by boats carrying that arrangement. Draw your own conclusions.

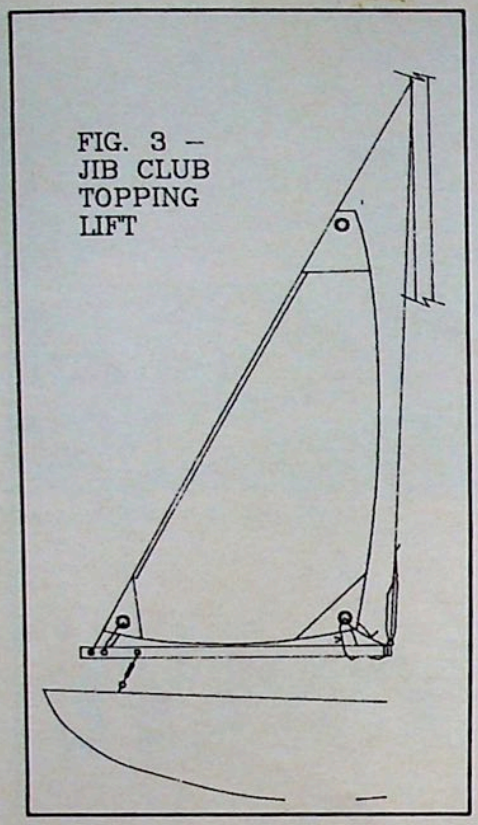
The second method is to reduce the load being carried in the leech of the sail by the use of a topping lift. Some folks refer to this as a leech line, but a leech line is actually attached to the leech of a sail, usually in a tabling or hem. The proper term here is topping lift. The topping lift runs from the after end of the jib club and up to the point where the jib stay meets the mast. A bowser adjustment is usually provided, as is a tensioner, made of a rubber band, which keeps the topping lift from slacking and wrapping itself around the spreaders when off the wind. Some experience is required to make a topping lift work efficiently. I've even seen them used in conjunction with the counterweight arrangement.

The offset jib swivel is popular because it is simple, easy to construct, and reduces the number of bits and pieces required. Some jib swivels have consisted of a single piece of nylon string! On the other hand, use of such an approach provides a system where the parts are very interrelated, with each piece doing more than one job. For example, the jibstay tension is shaping the jibstay as well as providing the leech tension and the downward force on the jib club.

An alternate approach has been employed on many classes of boats and for a long time. The theory here is to separate the functions and assign them to different pieces of the boat. The benefit is an ability to adjust one thing at a time and not have it affect anything else. The down side is an increase in complexity, more things to adjust, a likelihood of more weight above the deck, and the potential for things to go wrong. Nevertheless, this approach has proven fruitful, if nothing else.

One first decides which functions to control, and makes provisions for them in a manner which separates that control from the other things going on.

1. Jibstay tension - Lead stay direct-



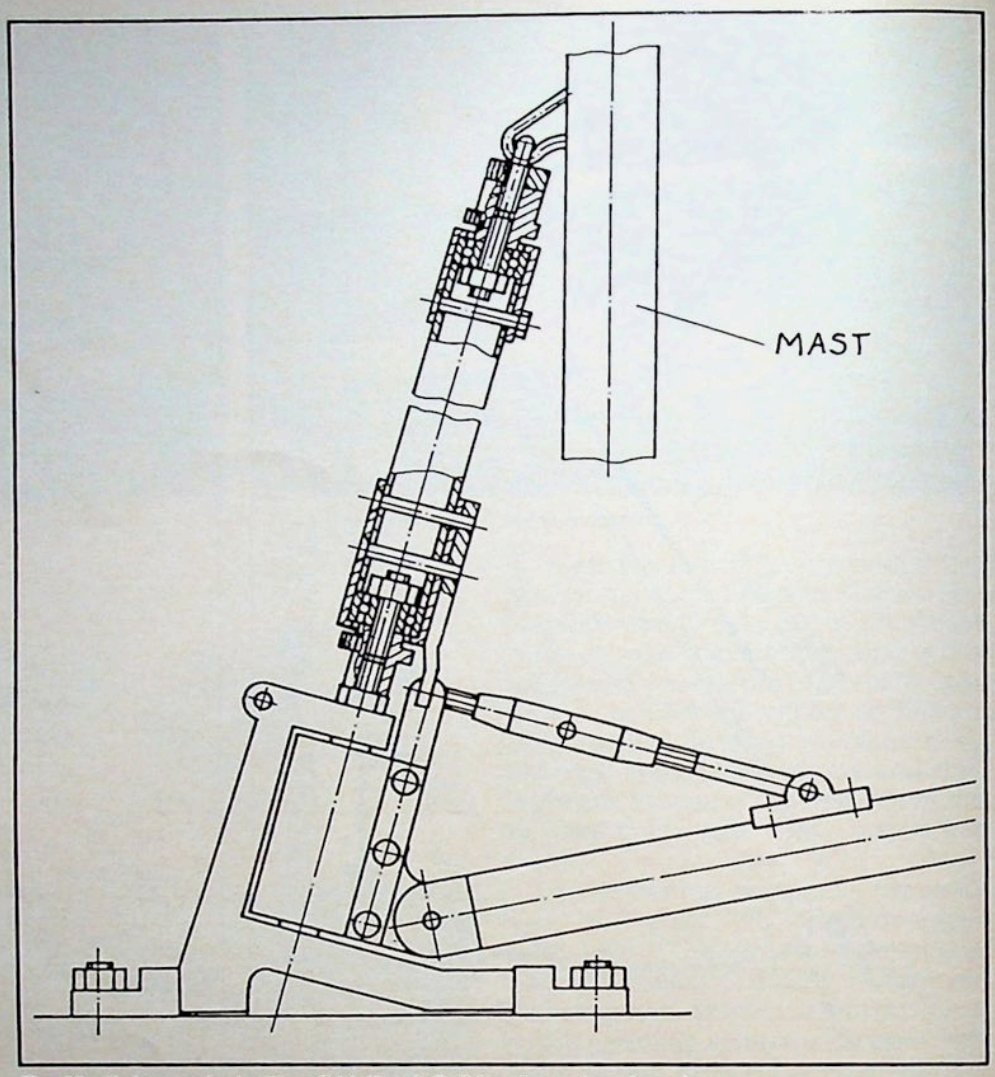


Fig. 12. Jib boom pivot with solid luff rod. Ball bearings at each end.

ly to deck.

2. Jib club swivel - Swivel club on an axis parallel to jibstay.

3. Jib club lift control - Use a separate vang or an immovable club/swivel mechanism.

4. Jib foot camber control - Offset swivel from jibstay to provide automatic increase in camber as jib club goes off centerline of boat.

5. Wing and wing - Provide assistance to jib club to "wing out" when running downwind.

The result can be something like my unit shown in Figure 4. The jibstay and the jib tack fitting hook directly to the pitting by using the S-hook. In this way, jibstay tension is strictly related to backstay tension. The sail is cut to set on a die-straight jibstay, but when required, the stay can be slackened and extra camber will be pushed into the center of the sail, without impacting any other setting.

The actual swivel is a 3/8-inch brass post about one inch aft of the stay. It is parallel to the stay. A handmade aluminum fitting attaches to the brass extensions and the jib club. This entire assembly is rigid and strong enough so that the outer end of the jib club cannot lift. Notice that the S-hook attaches to a transverse piece of brass which prevents the entire fitting from rocking in the transverse direction. The distance between the stay and the swivel allows the camber of the jib to increase as the sail is let out. This is important because more camber is required on the reaches and the runs. This arrangement gives it to us automatically.

For assistance in obtaining the wing-and-wing position, a rubber band or two is attached above the swivel from the club to a pin just aft of the jibstay. As the sail moves outboard, the rubber band pulls it out (In super light air, one must be careful not to let the sail get loose on the wrong side of the boat).

While a bit ugly, the fitting has now been in use for about six months with no real problems. The aluminum is wearing faster than the brass, so I'm going to have to remake that piece eventually. Dimensioned drawings for this fitting are not available. I've just told you all I know about it.

At the same time I was building this fitting, other skippers in the local area were also experimenting. Photos of their efforts are enclosed for your consideration (Figures 5, 6 and 7).

Also presented are a series of photos (Figures 8, 9, and 10) of some European M-Class boats and their fittings which were sent to me by Herb Hoser of 675 S.W. 238th Ave., Hillsboro, OR 97123. Herb imports the PeKaBe line of fittings, and is in my experience the most responsive supplier we have in our

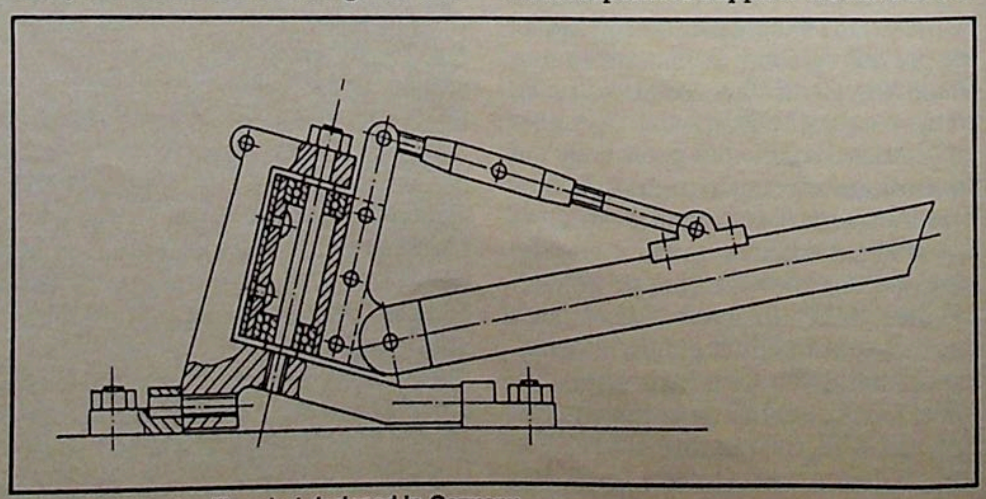


Fig. 11. Ball bearing jib swivel designed in Germany.

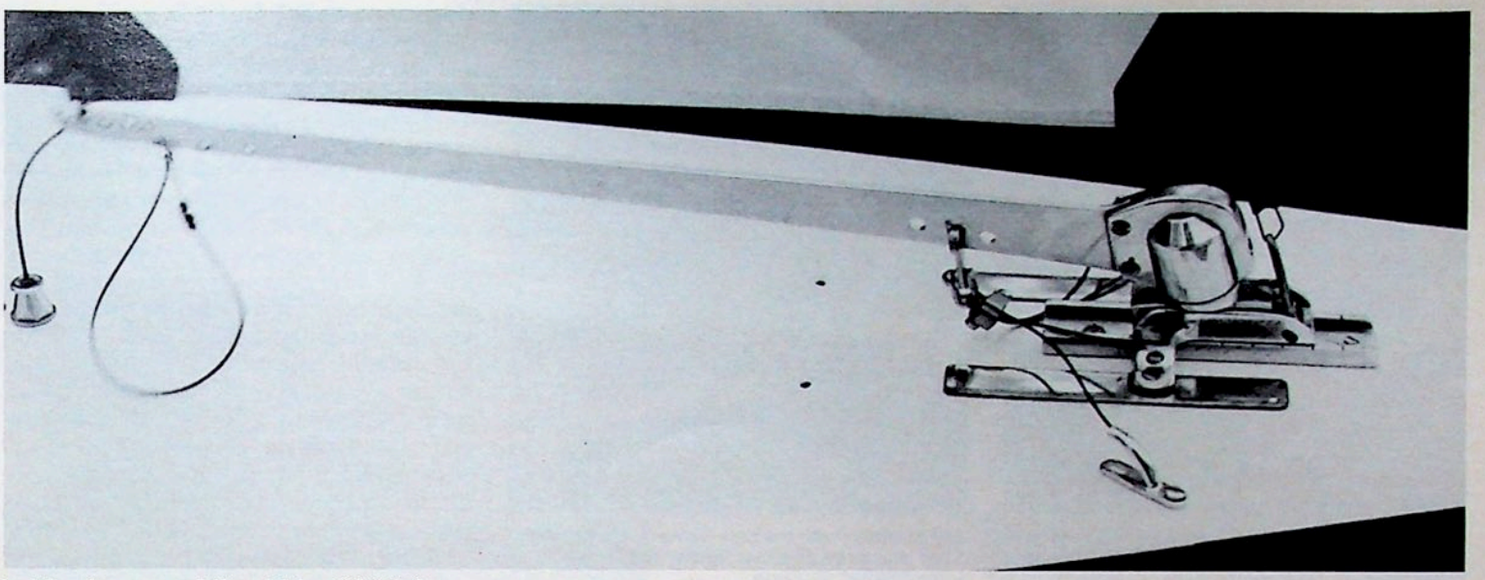


Fig. 8. A series of photos of some European M-Class boats and fittings, shown here and two photos below.

hobby, bar none! Send him $2.00 for a catalog and a SASE with about 75 cents on it. The photos show a lot of the things we have been discussing. You'll see some leads for lines which can be used to pull the jib club to one side or the other. There are counterweights, vangs, rubber bands, and a whole host of good ideas here.

Figure 11 is a cross-sectional drawing of a ball bearing jib swivel designed in Germany. Note that the vang is above the jib club and acts in compression rather than tension, as is typical for underslung vangs. This drawing is a design concept, and I'm not aware that such a thing is actually for sale anywhere. Figure 12 shows a solid luff rod mounted above the jib swivel with ball bearings mounted on each end. In this way, there is no friction between the luff of the sail and the luff rod, thereby allowing the sail to turn with an absolute minimum of effort.

Next month we'll have a real potpourri of photos and odds and ends that you have sent in. There are a lot of interesting boats being built and I'm very pleased that you are willing to share them with the rest of us.

If you are looking for a source of high-tech materials like carbon fiber, kevlar, end grain balsa panels and the like, send a self-addressed, stamped envelope (SASE) to Aerospace Composite Products, P.O. Box 16621, Irvine, CA 92714, (714)250-1107.

Remember to send your 1989 dues of $20.00 to the AMERICAN MODEL YACHTING ASSOCIATION, c/o Pat Hein, 1884 Campus Court, Rochester Hills, MI 48309. The information in its Quarterly Newsletter is worth many times that. And as long as you are in a writing mood, drop me a note and photo of your latest project to: Rod Carr, 3011 - 177th Ave., N.E., Redmond, WA 98052. •

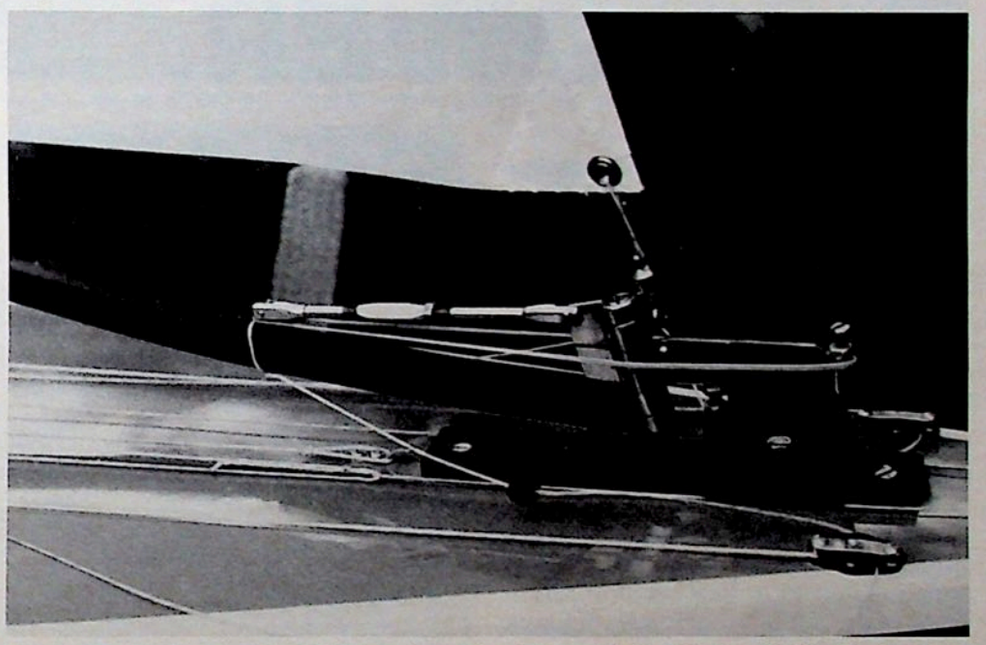


Fig. 9. Interesting that in spite of all the exotic mechanics, a good old rubber band adds a final touch to this one.

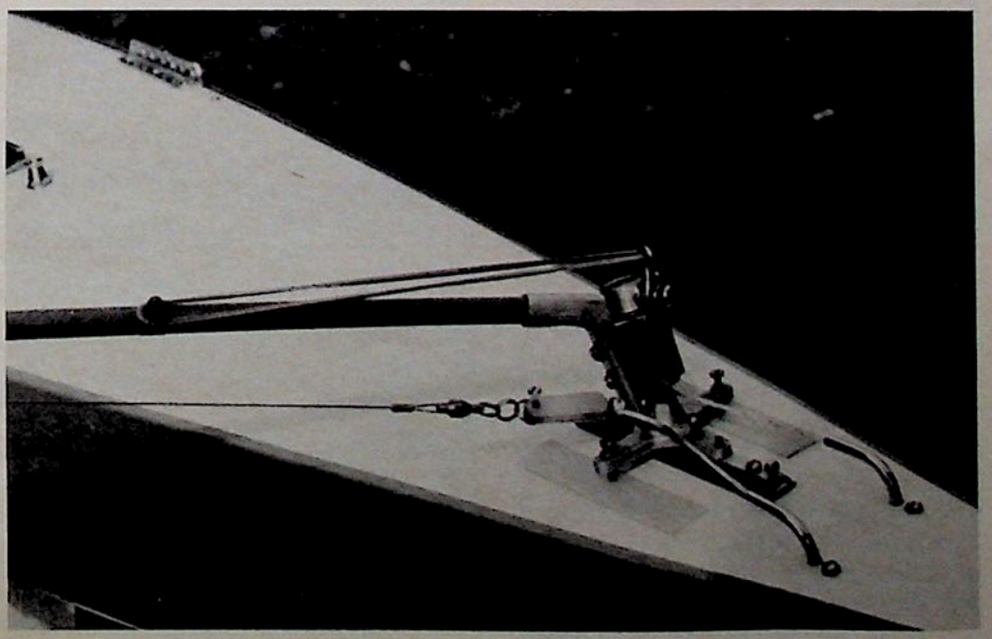


Fig. 10. See text for information about obtaining catalog showing these and other items available from overseas.

Jerry Dunlap with Jay Brandon, of Dumas, and the new electric semi-vee which Jerry helped develop.

Jay Brandon with the new Skater Catamaran for 11cc inboards and the "Miller American" Unlimited/Sport 60 Class.

R/C POWER BOATS

By JERRY DUNLAP

12 2014 L.L.

No, it isn't a Canadian zip code, it's the title for a unique model boating endeavor conceived by Al Prather, of Prather Products, Wilmington, California. The "12 2014 L.L." project is actually a subproject of the Legg Lake Improvement Fund. The Legg Lake Improvement Fund, also being spearheaded by Al Prather, is an ambitious undertaking to privately finance some $15,000 in improvements to the premier running site in Southern California. The improvements would include a permanent drivers' and officials' platform and paving of the parking lot.

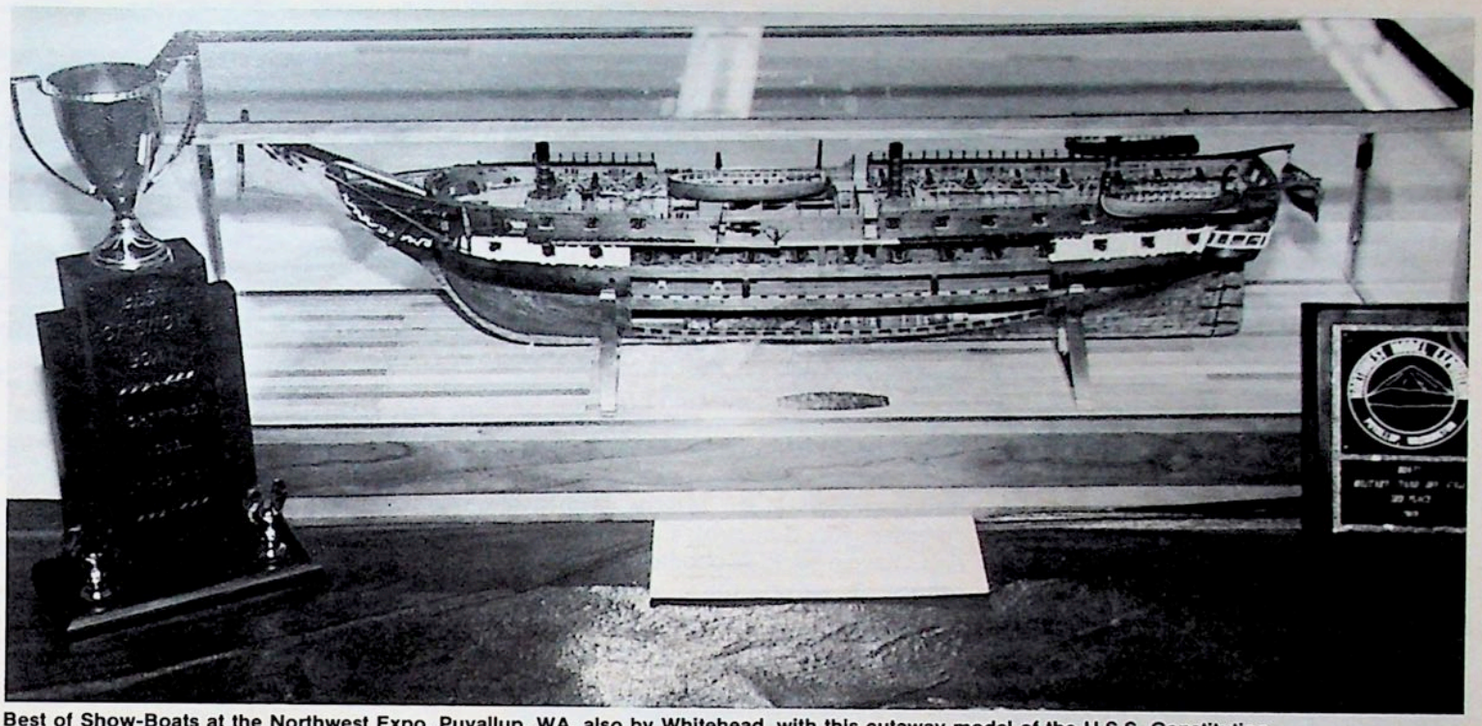
I've attended a few model boating events at Legg Lake and these additions will really enhance what is already a pretty nice place to run model boats. I think many of the model boaters in Southern California might consider the paved parking lot a bigger bonus than the drivers'/officials' platform. I can attest that the present parking lot ranks right up there in the "Best of the Worse" parking lots used by model boaters.

For the past year, model boaters in Southern California have been conducting raffles to generate funds to cover the cost of the improvements. Many of the prizes for the raffles have been donated by Prather Products and K&B Manufacturing and Circus Circus. Besides the money raised through the raffles, many individuals have made generous donations to the Legg Lake Improvement Club.

Plans call for the completion of the Legg Lake Improvements sometime in 1990. As part of the dedication ceremonies, a time capsule, to be opened twenty-five years hence, will be placed at the back of the drivers'/officials' stand. "12 2014 L.L." will mean the capsule will be opened in December of 2014. I imagine some of you really astute readers have figured out "L L." stands for Legg Lake. Guidelines for opening the capsule in 2014 call for this to be done at the end-of-the-year award's ceremony for what is currently District 19.

Besides lots of model boating memorabelia, like pictures of people who have made significant contributions to model boating, newsletters, rulebooks, video tapes, model boating magazines (yes, a copy of a U.S.B.&S.M. will be in the capsule), a K&B 7.5 Outboard sealed in grease, and names of people who contributed to the Legg Lake Improvement Fund, a number of non-model boating items will be enclosed. Some of these items will include a picture of President Bush, a picture of Oliver North, and supermarket weekly newspaper advertisements so comparisons can be made between 1990 and 2014 food prices. Pictures of the Stealth Bomber and the space shuttle along with a Knotts Berry Farm Chicken Dinner Menu will be stuffed in the capsule.

First in Non-Military Stand-Off Scale at the Northwest Expo, a whaleboat by P.E. Whitehead, actually made of whale bone.



Best of Show-Boats at the Northwest Expo, Puyallup, WA, also by Whitehead, with this cutaway model of the U.S.S. Constitution.

USB&SM contributing editors, Jerry Dunlap and Dave Frank, teamed up to win Best Offshore at NW Expo with Prather 3.5cc Offshore Deep Vee (reviewed in Winter '88 issue).

As "priceless" as all the above mentioned "stuff" might be, Al Prather was able to obtain something that really will have some amount of financial worth. Through an acquaintance who owns a large rare coin business, Al obtained a rare coin that will be placed in the capsule. At the time of this writing, the ownership of this coIn in 2014 has been raffled off. However, the name of the winner of the coin will not be announced until the 1990 N.A.M.B.A. District 19 meeting after the completion of the drivers'/officials' platform and placement of the time capsule. This particular rare coin has an estimated value of between $15,000 and $25,000 in the year 2014. The donator of the coin, Hannes Tulving Rare Coin Investment Firm of Newport Beach, California, has agreed to purchase the coin in 2014 based on the price list of the Rare Coin Market Digest in December of 2014. At the rate at which high nitro fuel has been increasing in price, the owner of the coin might be able to afford to purchase ten gallons of 50%.

ATTENTION VICTOR WILSON IN SCOTTSDALE

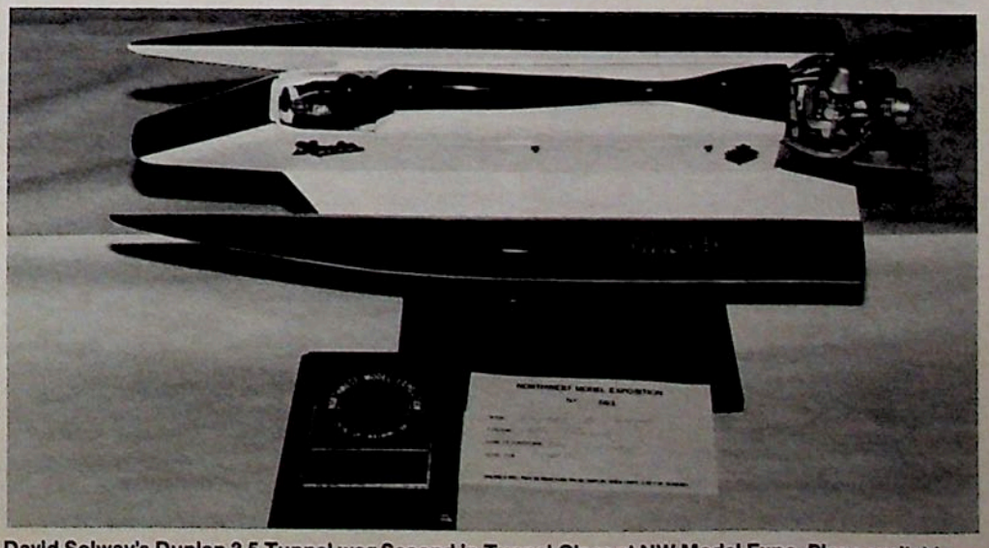
Victor, you may be wondering if Dunlap answers his mail. Well, I try to and in your case I did. Only problem was I miss-addressed the envelope and when it was finally returned to me, I had lost your address. So, here's basically what I wrote in that letter.

A 7.5cc outboard could be mounted to the transom of any 7.5 deep vee intended for inboard application. However, I suggested you check out the Prather Deep Vees because they offer an outboard handling package for their boats. For sure, get a 7.5 size vee because the length is needed to handle the weight and power of the 7.5cc outboard.

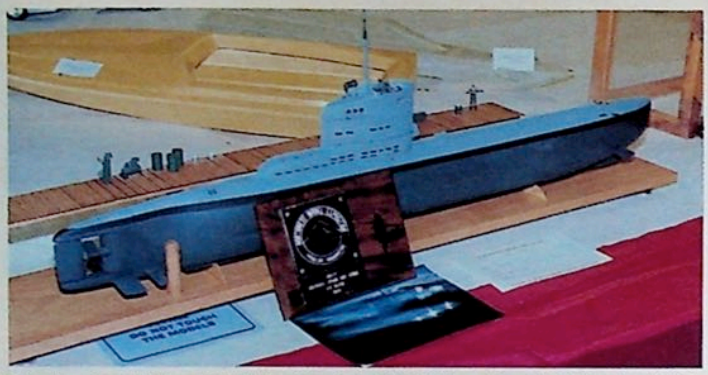
If you drop me a line again, I'll also return the money you sent for any information or catalogs I might have about products/services I offer to model boaters.

SPEAKING OF LETTERS

I do get occasional inquiries about



David Solway's Dunlap 3.5 Tunnel was Second in Tunnel Class at NW Model Expo. Plans available from USB&SM.



Bob Jacobson's Type VII U-boat took first in Military Stand-Off Scale at NW Model Expo.

Mike Stern's 11cc Dunlap Tunnel powered with 7.5cc K&B, Octura X450. Built from USB&SM plans. He's from Lawndale, CA.

building my designs that have appeared in U.S.B.&S.M. and on occasion I have custom built my designs. I should mention, Victor did not inquire about my building boats.

The problem with building model boats for others, at least in my opinion, is most people are shocked when you quote them a price to build a model. I value my time greatly. When I'm building something for someone else, I'm not working on my personal projects. There might be some who build models for minimum wage, but I'm not one of those. I recall one person telling me he could buy a fiberglass version of one of my designs for much less than I would charge to build it from wood. My advice to him was, "Go buy the fiberglass version!"

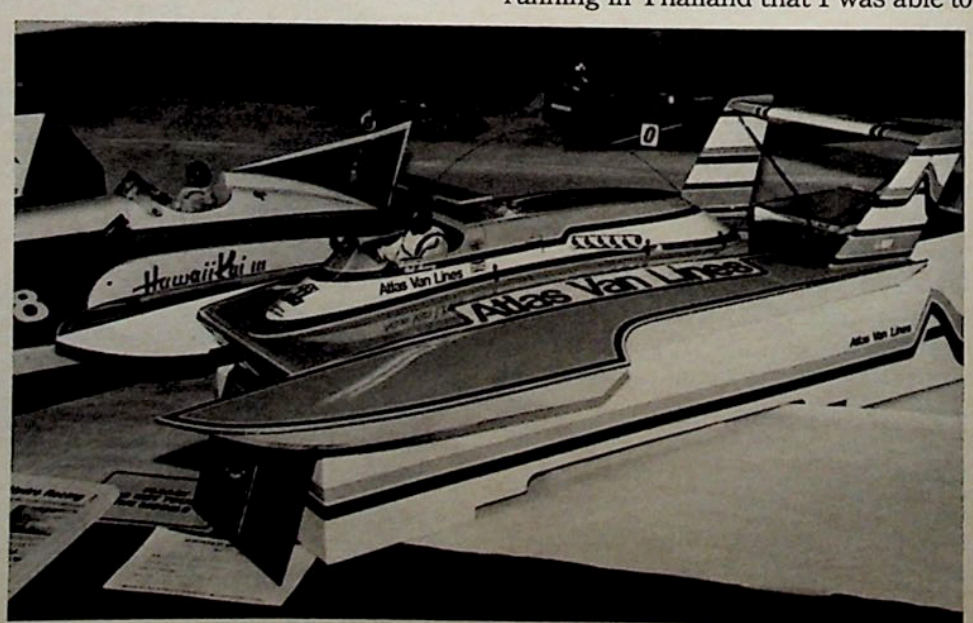
It amuses me somewhat when someone questions, "How can you charge that much to build a model? After all, it's a hobby." When a model builder builds for his own use, it's a hobby. When you begin building for others, you have a business. I've heard it said the goal of a business is to make money. That always seemed reasonable to me and I've applied the principle when building models for others. Would it surprise you that with this attitude I don't have a backlog of boats to build for others? As summer is a period when I do have a little extra time, I have prepared a price sheet for custom building Dunlap Tunnel Boats. It is available by sending a self-addressed, stamped envelope to: Dunlap Model Boats, 119 Crestwood Dr. S.W., Tacoma, Washington 98498.

The Byron Originals plastic field/pond tote box. A great accessory for model boaters. A real nice gift item.

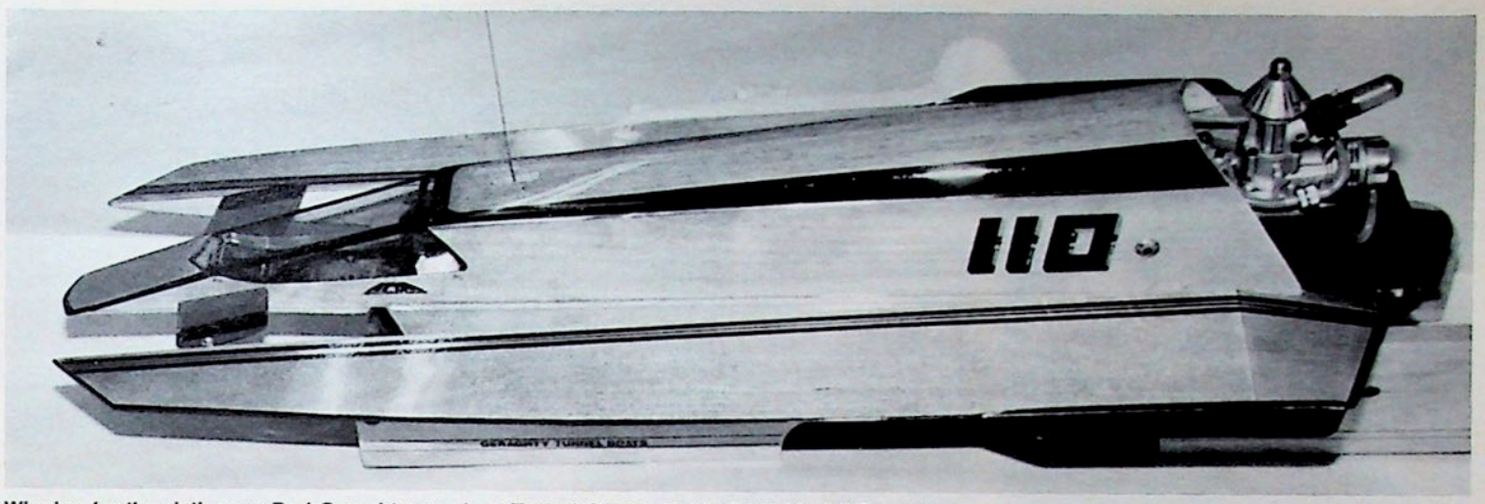
HEAT, HUMIDITY, WATER TEMPERATURE, AND PERFORMANCE

Now those are good topics for a column appearing in a summer issue. Actually, they were topics of conversations I had recently with a model boater who lives in Bangkok, Thailand. This model boater is involved in the import/export business and makes occasional trips to the United States on matters of business. On a couple of occasions, when in my area, he has called to discuss model boating.

He is active in racing model boats in Bangkok and most of his questions are of a performance nature. He reads U.S.B.&S.M. and buys many of the products advertised as well as following the suggestions in columns. He mentioned he especially enjoys reading my "Product Surveys" to see what propeller I'm using on different boats. He said it was his experience he could not run the same size prop on a boat he was running in Thailand that I was able to



Atlas Van Lines unlimited by Don Mock took first in Sport Hydro.



Winning for the sixth year, Rod Geraghty won best Tunnel Class with his Geraghty 3.5 Tunnel.

swing here in the state of Washington.

This led to a discussion of the type of conditions under which he ran model boats in Thailand. According to him, the weather is usually very warm, 80-90 degrees, and the humidity is also very high. The temperature of the water they run on is in the mid 70s. From my experiences, and it is limited because I live in an area where the weather is usually temperate and not humid, all three of these conditions tend to have an adverse effect on model engine performance. I know many model boaters in the southern and eastern parts of our nation experience these conditions. In discussions with some model boaters from these areas, I have been told about the difficulties in achieving peak engine performance.

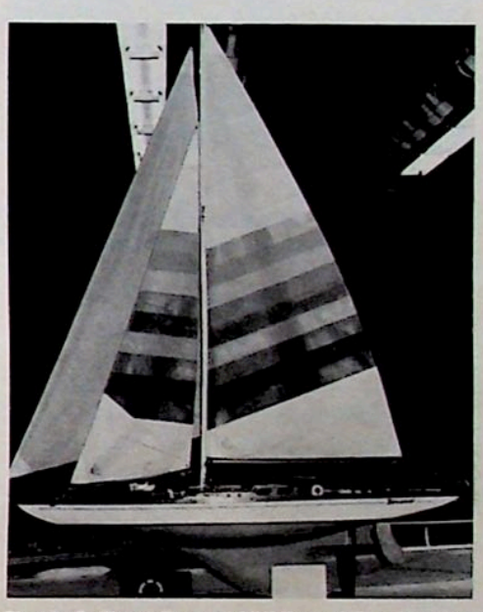
What does all this have to do with the propellers I use in the Northwest? The ability to swing a certain size and pitch of prop is a function of the power producing capability of the engine. When weather conditions restrict engine performance, propeller selection must be taken into consideration.

Altitude is another limiting factor on engine performance. This point was really brought home to me at the 1977 NAMBA Nationals held in Reno, Nevada. The R/C Unlimited racers from the Northwest couldn't even get their unlimited models to plane using the props they were used to running in the Northwest. I recall there was some serious scurrying as the R/Cers tried to locate smaller props that would work at Reno's higher elevation.

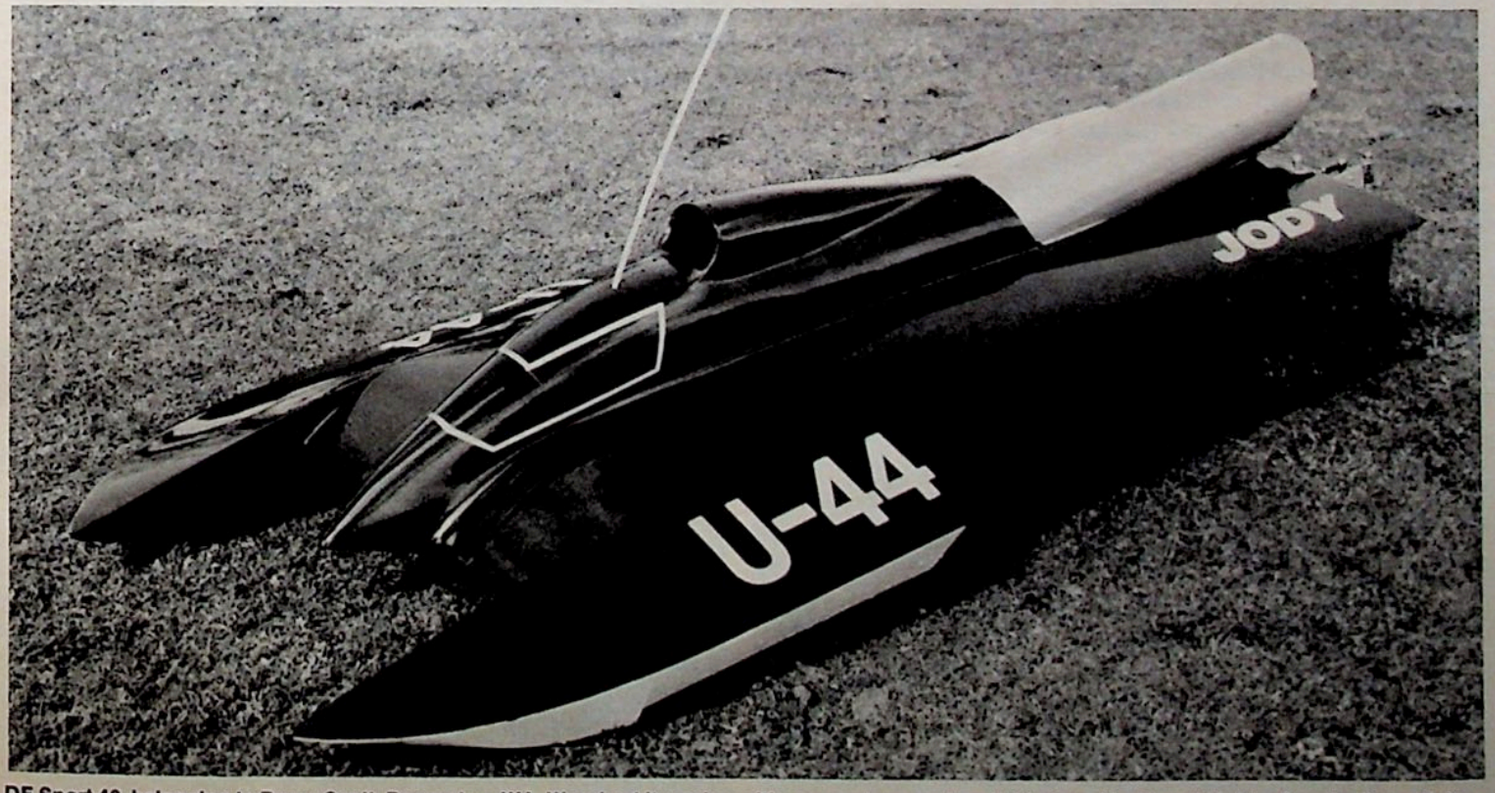
A PLUG FOR ONE OF OUR OWN

David Frank, a good friend as well as

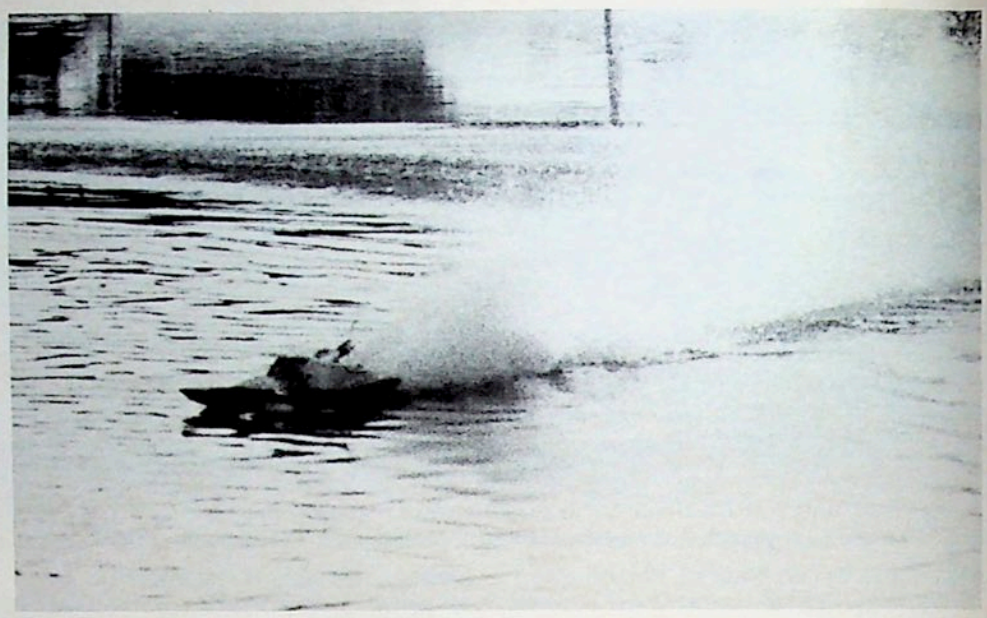
Continued on page 69



First in Sailboat Class at NW Expo, Mike Church and his original "Dreamer."



DF Sport 40, belonging to Bruce Scott, Bremerton, WA. Wooden kit version with epoxy glass cowl available from Northwest Hobby Supply. See article for info.



Left: The author with his OPS .80 powered Avenger and T-shirt that tells it all.
Above: The Avenger approaching at half throttle. Note no water coming off front sponsons, denotes clean running design with very little drag.

The 80-Size AVENGER

By ALAN HOBBS . . .

During the early 1970's, an outrigger design called the Climax earned a reputation for speed by winning many races along the East Coast. The Climax was a 60 size outrigger hydro that was easy to set up and drive. Louis Durand, a New Orleans area hydro racer, did some design work to try to improve the Climax.

The result was an excellent kit, available in sizes for .21 to .90 engines. Louis called his new boat the Waterspider. I built two Waterspiders and raced them during 1980 and 1981. The boats were simple to set up and easy to drive. However, the wood used did not hold epoxy very well and eventually the boat would pull itself apart. The design was great, but many boaters were disappointed.

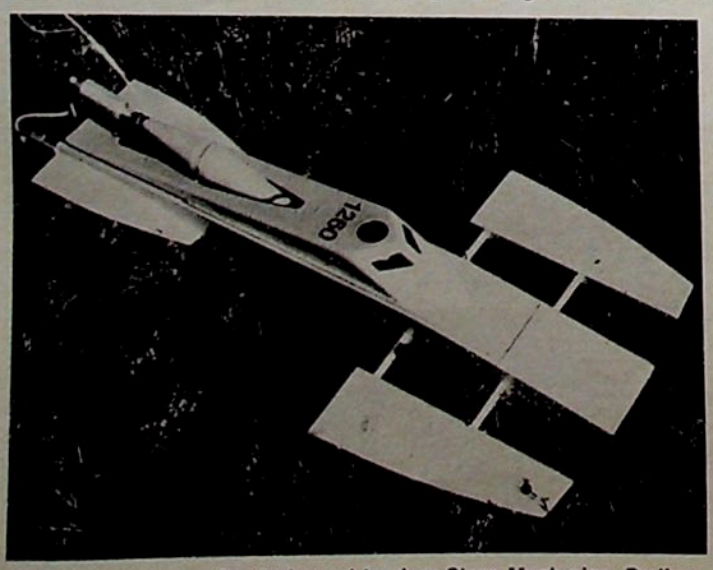
In 1987, a friend to all model boaters, Bob Murphy of Shamrock Competition Imports, the OPS distributors (P.O. Box 26247, New Orleans, Louisiana 70186 (504)242-5967), suggested I look at the new Spider kits. Don Wagner had begun kitting Spider boats in 1983.

The kit materials were excellent and my new hydro earned a perfect score by winning all of its heats at its first District Points race. Because I rarely win that many heats at a points race, I called Don Wagner to thank him for offering such a good kit. Don then told me about his other outrigger design, the Avenger.

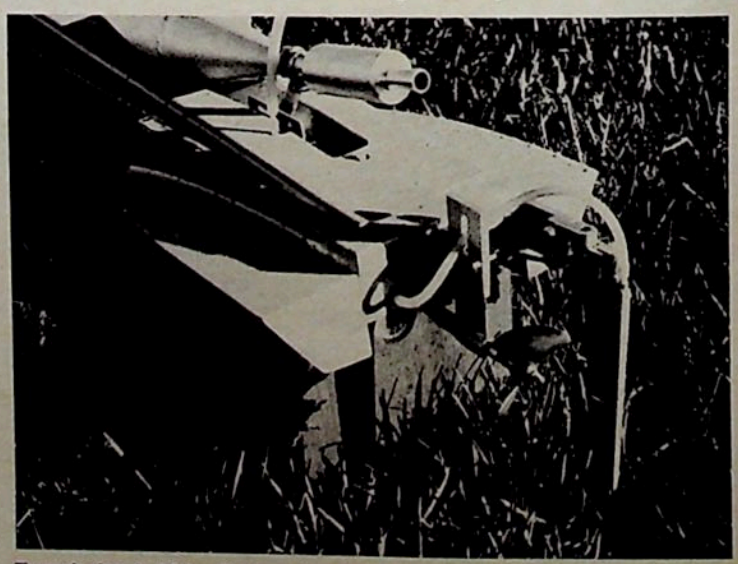
During 1988 I campaigned an OPS .80 powered Avenger. It ran well, winning more than its share of heats at District Points races. But the high point of 1988 came at the First APBA Model Racing Commission National Championships. My Avenger became the first US-1 of its class, winning 30cc Hydro.

The Avenger is easily built. It is available inexpensively as a flat kit, or you can get it partially built with finished sponsons and center section. Kits are built for different engine sizes from 21 to a twin 80 hull that is the definition for the word "awesome."

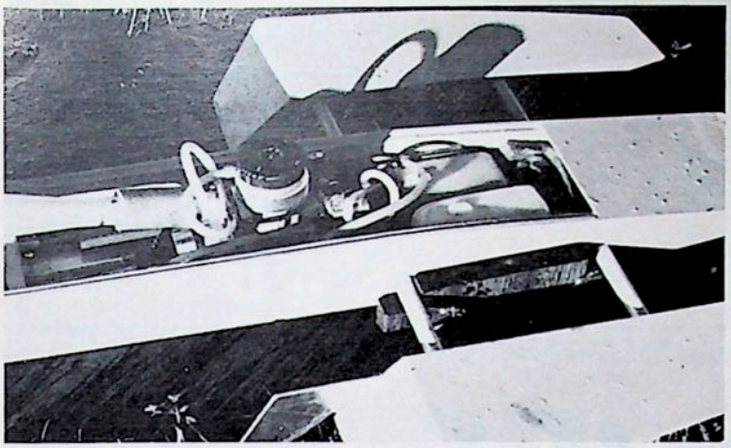
Use one of the motor mounts available from the factory. You can get your boat with a solid, bolt-down mount, or the new, rubber-isolated mount to reduce noise and vibration. There is also a factory made turn-fin available that works perfectly on the hull.

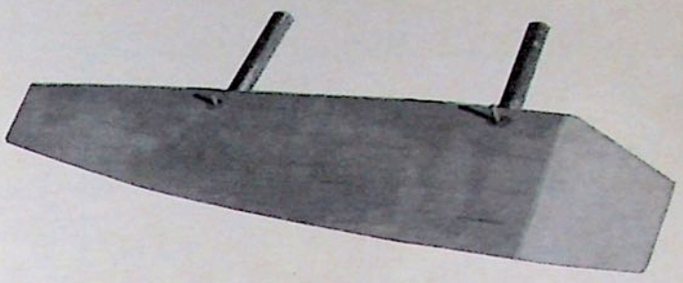


US #1 after test run. Cowl trimmed to clear Steve Muck pipe, Prather muffler, and engine head. Air holes in front.



Tuned pipe held by Prather bracket. Speedmaster rudder with built-in water pickup. Power Products hydro strut, Octura X465 prop.





Above: Hardwood dowels used to pin booms inside sponson. Necessary to keep sponsons in place.
Left: OPS engine and mount fit easily in engine compartment. Stock turn fin pivots outrigger at its center of gravity. Fuel tanks pressured from tap on tuned pipe.

The Avenger is very easy to set up and drive. You can use whatever brand hardware that you prefer, but do use a flat bottomed surface drive strut. If you want to set your Avenger up just like my US–1, get the following items:

1. Stock motor mount and turn-fin.
2. OPS 80 Marine engine.
3. RPM carburetor for the OPS .80.
4. Steve Muck .80-size tuned pipe.
5. Power Products square drive cable and cable nut.
6. Power Products heavy duty hydro strut.
7. Speedmaster aluminum machined wedge rudder.
8. Aeromarine Laminates teflon-lined stuffing box.
9. Prather Products tuned pipe mount.

Build the boat according to the easy-to-follow instructions. The boat goes together quickly using epoxy. The wood sides and cross frames are straight-grained and light cedar. The wood is thick enough to give a good glue surface and does not need doweling or toothpicks to strengthen the joints.

With the center section completed, coat the inside with thinned slow set epoxy. You can either use heat or a little lacquer thinner to thin out the epoxy. The epoxy will protect the hull from high nitro fuel and add years to the life of your boat.

Bolt the motor mount through the hull floor and hardwood mount supports. Use large washers or aluminum sheet to protect the hull bottom from the bolt heads. Lock nuts and washers hold the mount down and in place. This mount system makes it easy to remove the engine and mount for thorough cleaning.

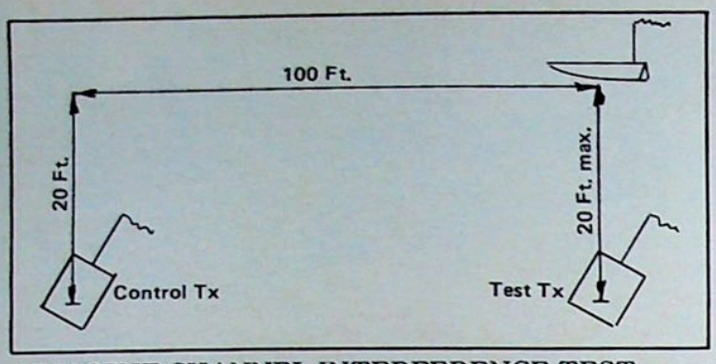
With the engine installed and the surface drive strut installed, line up the stuffing box. Use scrap plywood to support the stuffing box both inside and outside the hull. The stuffing box should extend within 1/4 inch of the engine cable nut. This will prevent the cable from whipping around and tearing out the stuffing box.

Use fiberglass cloth strips and epoxy to hold the stuffing box and supports in place. The Power Products square drive cable system uses an Octura flex ferrule in front of the strut. Again, the stuffing box should support the flex cable to within 1/4 inch of the flex ferrule. Keep the stuffing box alignment such that the cable, stubshaft, and engine spin over with no drag.

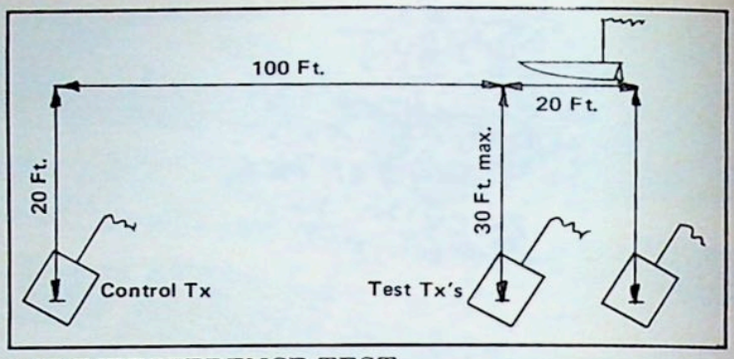
The Avenger design provides a tape-down radio box lid. While many boaters still use screws and small bolts to hold down the radio box lid, the tape-down method is getting more popular every year. Radio box tape is readily available

Continued on page 70

Left: Gerry Pinsonneault with his Twin Rossi .80 powered Avenger. Can only be described as awesome. Steve Muck pipes and mufflers boost speed without excessive noise.
Below: Picco powered Avenger by Justin Hill, member of TEAM FAT, Scottsdale, Arizona.



ADJACENT CHANNEL INTERFERENCE TEST



30IP INTERFERENCE TEST

RADIO WAVES

By ELOY MAREZ . . .

This time around the course, we are going to discuss radio interference. . .the causes, and some of the preventive measures that one can take. This is a more than slightly controversial subject, one about which almost as much erroneous information has appeared as has about NiCd batteries. It is also a subject about which it is difficult to remain unemotional, as none of us like to lose a model, be it one that flies, crawls, runs, or swims. Still, emotion aside, there are some basics which have to be accepted, like them or not.

First off, the reason R/C frequency interference is more prevalent now than in years past is not due primarily to the new frequencies, but to the greatly increased number of radio transmitters in use. These are not R/C transmitters only, but those of commercial services, operating on federally assigned frequencies such as with ours. It is a matter of space and demand, and the results are not unlike the circus clowns in the Volkswagen. . .you can only get so many in before some eye and rib gouging is bound to take place. Technically speaking, we used to operate with 80 KHz spacing, and are now making do with only 40 KHz. In 1991, the model airplane 72 MHz band will shrink even further to 20 KHz, but due to the necessity of keeping non-flying models close to the operator for visual contact, not as many frequencies are required and the 20 KHz spacing for 75 MHz will not be implemented yet.

Additionally, this new frequency plan is not all part of a conspiracy on the part of the radio equipment manufacturers to make us all buy new systems. As a matter of fact, the new equipment specifications have considerably complicated life for them. Not that the design of equipment capable of better operation in our crowded environment is an impossibility, but the complications come in having to design and manufacture it for the $84.95 that the average customer is willing to pay. And it is not valid to point out that for the cost of a good high quality R/C system, one can buy a television receiver many times its size. . .in full color yet! The numbers manufactured and sold have great bearing on the item price, and also, in electronics, price is often inversely proportional to size. It is far more difficult, and costly, to manufacture something small and light than when space and weight are not prime considerations.

The AMA (Academy of Model Aeronautics) the R/C'ers only voice to the FCC (Federal Communications Commission), is not to blame either. Actually, they deserve your thanks, because we owe *all* our boating frequencies to their efforts on our behalf. Were it not for the AMA, we'd still all be on 27 MHz frequencies, and sharing them with CB'ers and garage door openers. The AMA has requested and coordinated frequency matters with the federal government for all modelers, without much in the way of assistance or even encouragement from the boat fan. Let's face it, there are not enough boaters in the country to have much clout, not against the well organized airplane modelers if they decided to go it alone for some reason, and certainly not against the commercial enterprises. It is bad enough to be few in total numbers, but their voice is made even smaller by being divided into. . .how many groups now?. . .all without contact or acknowledgement of each other. A sad situation indeed, one which I firmly believe cannot but help stifle the growth of R/C boating.

Another not always accepted fact, but one which is true nevertheless, is that frequency interference does *not* have to come from another R/C transmitter at the same location. You may be getting "hit" by someone operating a grain elevator in Kansas or setting off explosives in an oil field off the coast of

Continued on page 74

POTENTIAL 3RD ORDER INTERMODULATION PRODUCTS CHART fOR 75 MHZ R/C CHANNELS

THIS CHANNEL	MAY BE INTERFERED WITH BY THESE CHANNEL PAIRS						
62	64/66	68/74	70/78	72/82	74/86	76/90	
64	66/68	68/72	70/76	72/80	74/88	76/88	
66	64/62	68/70	70/74	72/78	74/82	76/86	78/90
68	66/64	70/72	72/76	74/80	76/84	78/88	
70	66/62	68/66	72/74	74/78	76/82	78/86	80/90
72	68/64	70/68	74/76	76/80	78/84	80/88	
74	68/62	70/66	72/70	76/78	78/82	80/86	82/90
76	70/64	72/68	74/72	78/80	80/84	82/88	
78	70/62	72/66	74/70	76/74	80/82	82/60	84/98
80	72/64	74/68	76/72	78/76	82/84	84/88	
82	72/62	74/66	76/70	78/74	80/78	84/86	86/90
84	74/64	76/68	78/72	80/76	82/80	86/88	
86	74/62	76/66	78/70	80/74	82/78	84/82	88/90
88	76/64	78/68	80/72	82/76	84/80	86/84	
90	76/62	78/66	80/70	82/74	84/78	86/82	88/86

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A serious boater de
Commander delivers.
made-in-USA radio th
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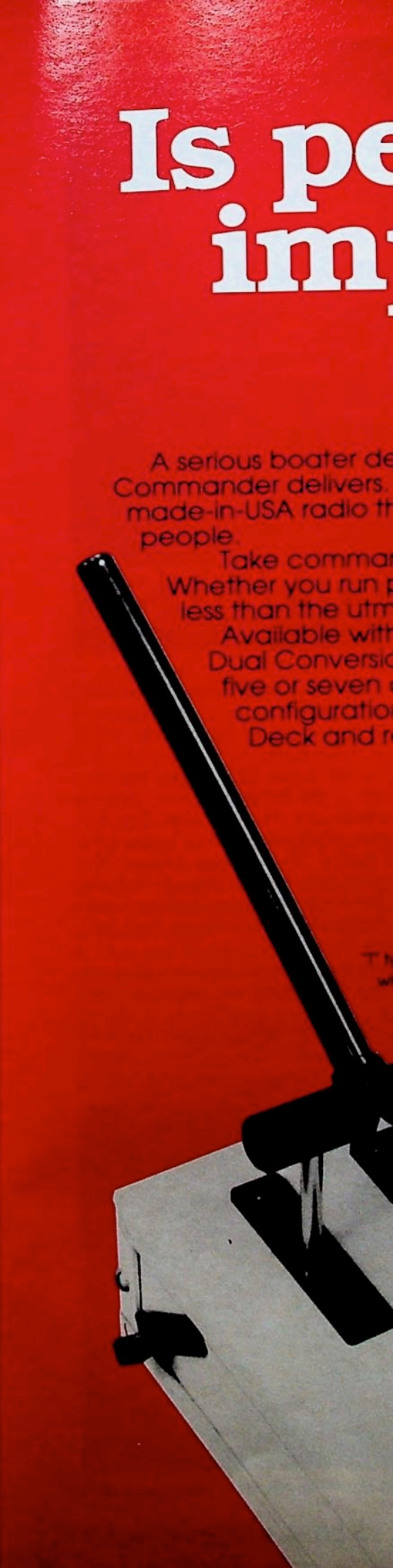


The '89 ORLANDO WINTER NATS

The Orlando Culvert Dodgers did it again, the 1989 I.M.P.B.A. sanctioned Winter Nationals put on by this fine model boat club was an outstanding racing event. This was the 8th annual Winter Nats to be hosted by the O.C.D. and the three-day event drew 157 drivers with 311 boats competing in four rounds of racing in 194 heats.

January 13, 14, and 15 turned out to be three nearly perfect days for racing, with temperatures in the low 80's, nearly cloudless skies, and a light breeze that barely put a ripple on the water. For a brief time in the morning and late afternoon, the sun's glare on the surface of the water caused a bit of excitement as the boats would disappear in a blind spot of glare for a split second (it seemed like forever) then emerge again.

C.D. Brian Kubik, president Bob Rozek, and all of the Orlando Culvert Dodgers put a lot of effort into organizing and running this race. The drivers got more than their money's worth of racing, and spectators were treated to constant fast-paced action. Spectators outnumbered participants by far, and no doubt a few caught the racing bug and will enter the hobby this year.

The entry deadline for this race was December 28, with a 300 boat limit. This had been filled by mid-November, a full two months before race day. if you would like to race in the Winter Nats next year, get your entry in plenty early.

Trophies were awarded through 3rd place plus an additional trophy for every five boats over 15 in a class; this gave everyone an equal shot at the hardware regardless of how many boats were in the class.

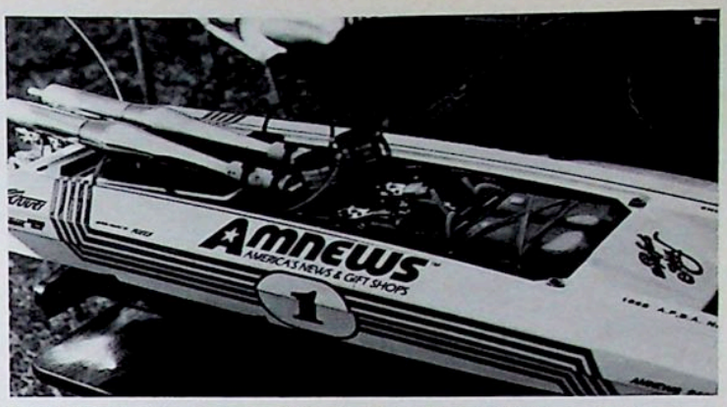
The 60 Scale Concourse was declared a tie between Dave Berry's checkerboard Bardahl and Jim Osborne's '66 Bardahl. Chad Turner took the Junior Trophy, and Cheryl Van Wagnen took best woman driver. For his 1400 mile trip from Quebec, Canada, Michael Newin won the long haul award.

Everyone also had a chance to go up on the C.D. stand and serve as turn judge for four races. The heat sheets asked the racers to help with the race by acting as turn judge and gave assignments as to when each driver should be

Mike Weeden mans the fetch boat; unsung hero of any model boat race.

Pit Boss Brad Young supervises launching.

On display at the Winternats. Specs include 400 horsepower and 141 mph.



Steve Garetano's cat ran in F Hydro. Sounded great with muffled pipes.

at the C.D. stand. This was a friendly idea that made out-of-towners feel at home and also freed up two O.C.D. members for other chores.

The growth of the Orlando Winter Nationals shows the popularity of model boating in the Southeast. Here's the address for information: Orlando Culvert Dodgers, Steve Halpern, 1384 Westdale Ave., Winter Park, Florida 32792.

Orlando Winter Nationals, January 13, 14, and 15, 1989.

20 O.B. Tunnel
1. John Otto
2. Jack Clark
3. Shannan Stebbens

20 Mono
1. John Otto
2. Ed Mayer
3. Rich Howard

20 Hydro
1. John Brown
2. Jack Clark
3. Donald Jones

40 O.B. Tunnel
1. Reedith Darville
2. Rich Howard
3. Shannon Stebbens

40 Mono
1. Cindy Rozek
2. Paul Bayarinas
3. Larry Squires

40 Hydro
1. Larry Maglinger
2. James Demmi
3. Rich Moore

Sport 40
1. Butch Wellmaker
2. Brian Briggs
3. Nick Hess

60 Mono
1. Ed Mayer
2. Bud Elder
3. Rick Demers

60 Hydro
1. Andy Brown
2. Eric Swenson
3. Craig Hutson

F Mono
1. Joe Ingrao
2. Jim Youngblood
3. Steve London

F Hydro
1. Dick Jones
2. Mark Vallery
3. Fred McBroom

60 Scale
1. Larry Maglinger
2. Joe Ingrao
3. John Castellano

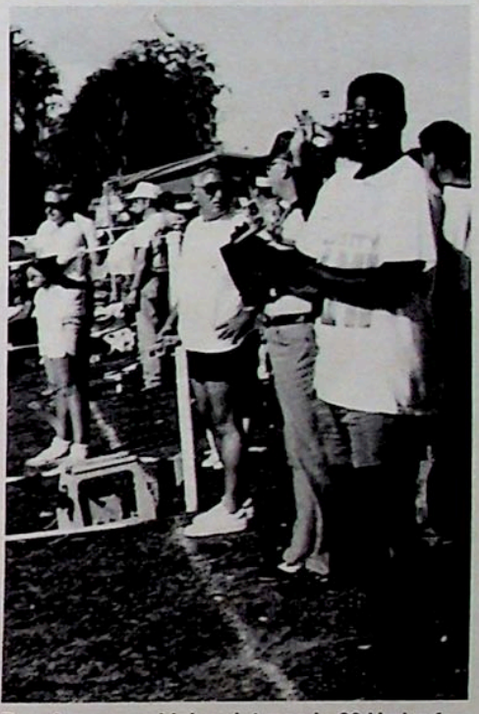
Scale Concourse: Dave Berry, Jim Osborne

Junior Driver: Chad Turner

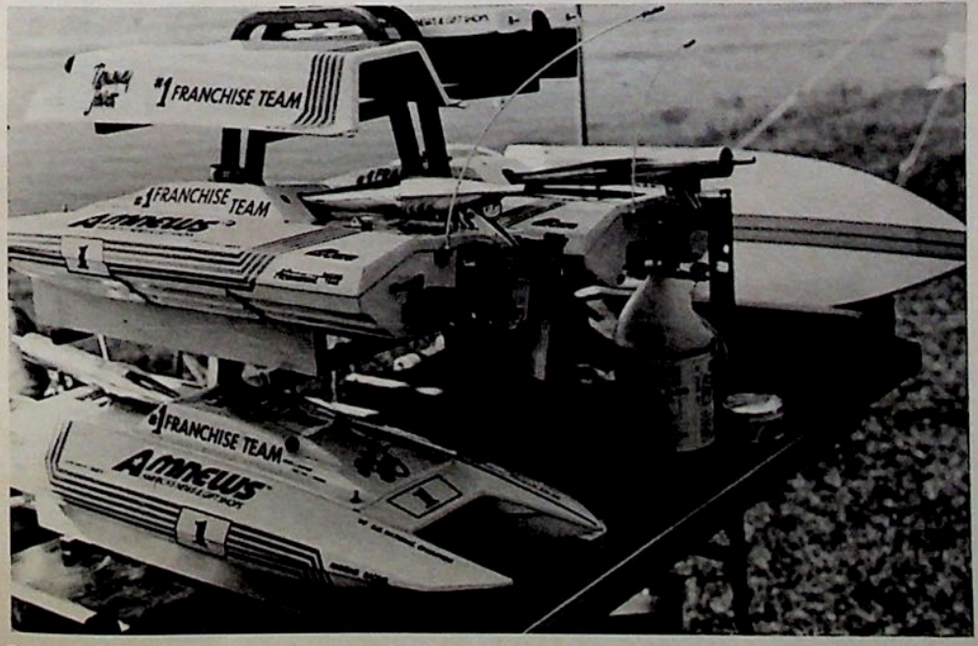
Woman Driver: Sheryl Van Wagnen

Long Haul: Michael Newin

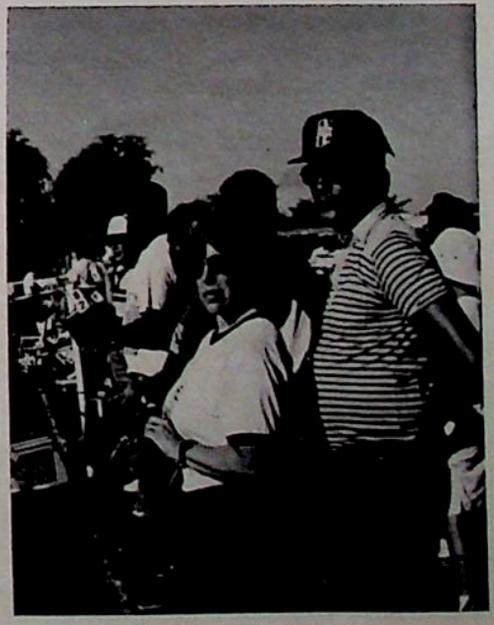
•



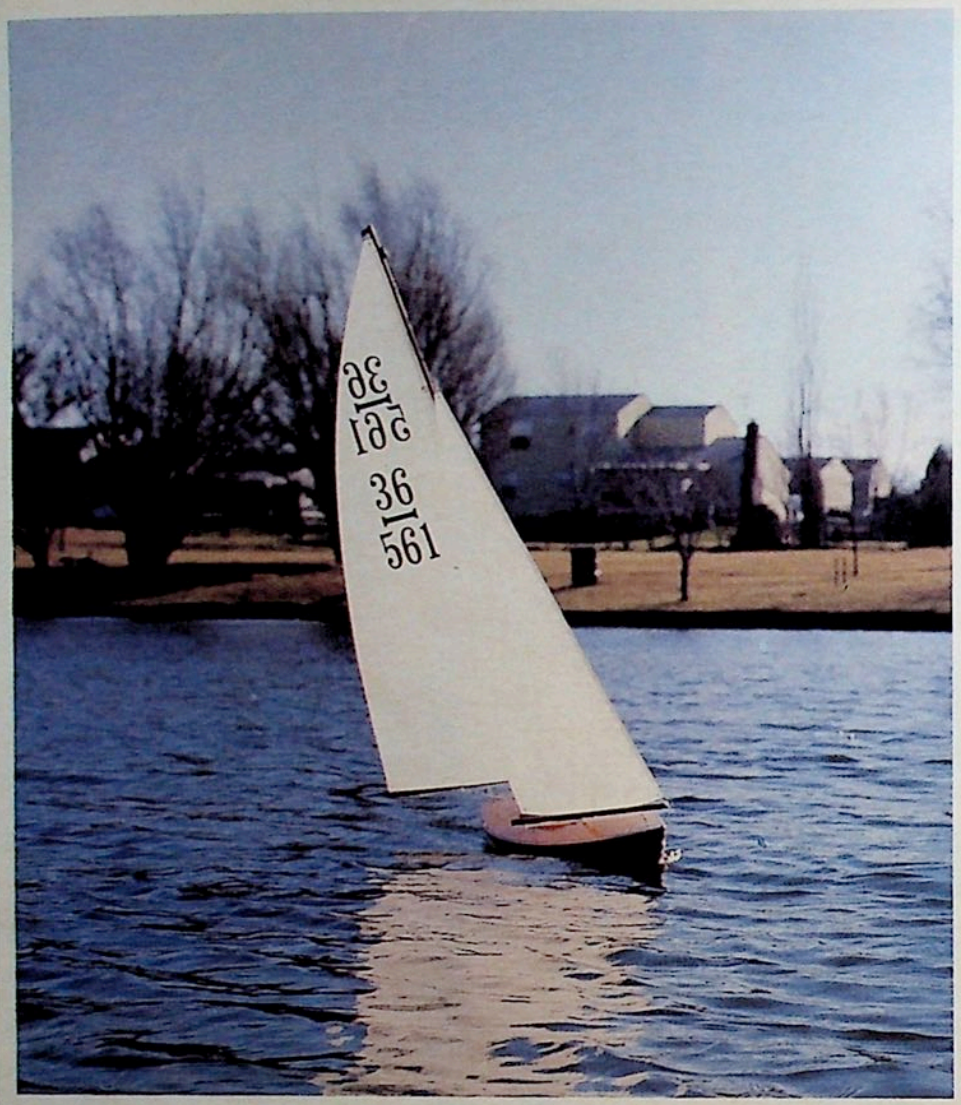
Don Jones was high point man in 20 Hydro for 1988.



Steve Garetano's bunch came all the way from New York and were definitely ready to race.



Sue and Bernie Bathauer in 20 Hydro race. She is IMPBA secretary.



VICTOR MODEL PRODUCTS

TAHOE II

By BARNEY KEMTER . . .

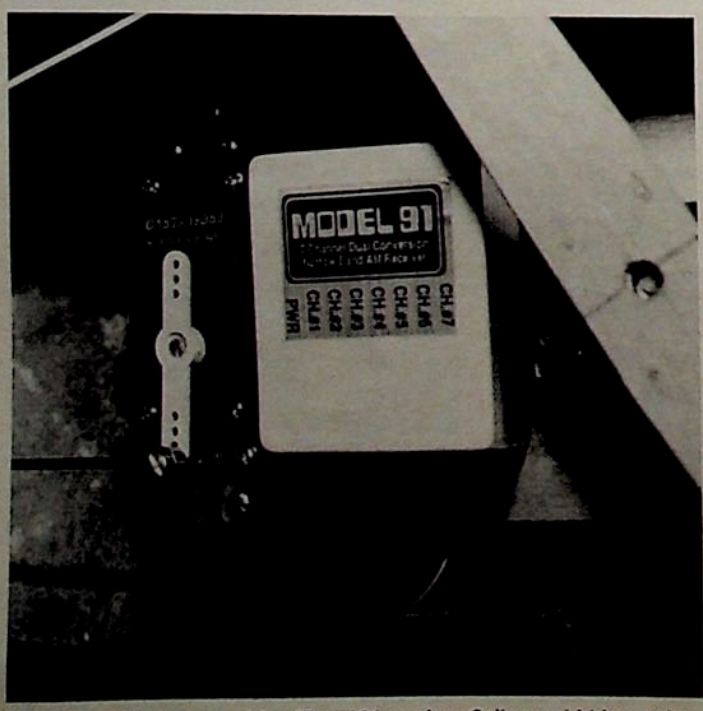
For several years, Victor Model Products has produced a line of entry level sailboat kits. These kits offer the modeler an excellent value for the money. The kits are well manufactured, include all required hardware, and come with a complete suit of dacron sails.

The TAHOE II is a radio controlled sailboat of 36 inches in length and carries slightly less than 600 square inches of sail area, 575 square inches to be exact. This combination makes the TAHOE II eligible to be registered and compete in the 36/600 class races of the American Model Yacht Association (AMYA). With over 600 of the kits sold in the past two years, there may be one or two sailing in your home area. The finished boat is small enough to fit in the back of a sub-compact car.

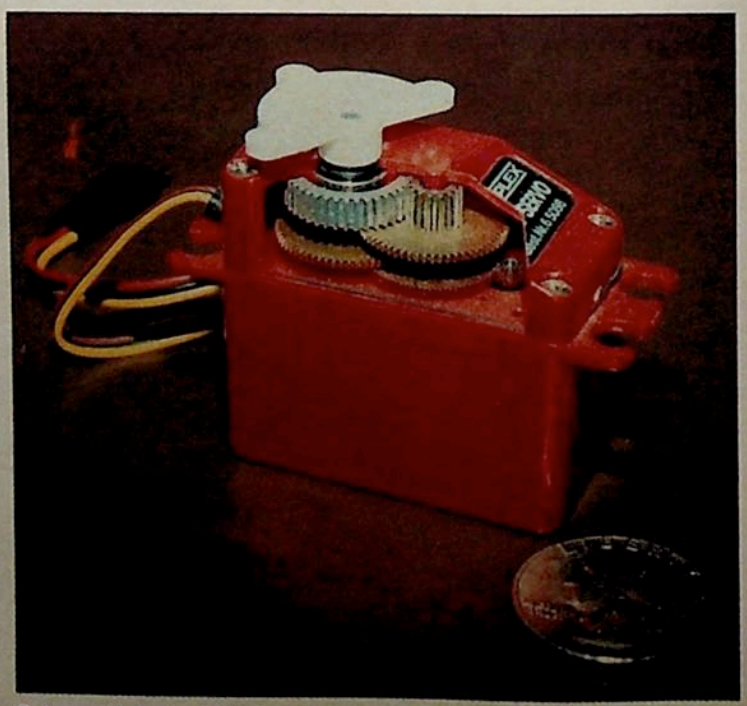
CONSTRUCTION

Construction of this boat is very straightforward. Molded plastic parts are of high strength styrene. The instructions with the kit recommend the use of Testor's Plastic cement or a liquid plastic cement such as Microweld. Also recommended is the use of C/A type adhesives when bonding wood to plastic. Having built several Victor Model Products kits, I used Hobbypoxy No. 3 in the major construction of this kit. No. 3 is a two-mix epoxy that does not run or soften the styrene. It stays where you put it and makes great fillets. If you do use epoxy adhesives, remember to roughen with sandpaper the areas to be joined, to remove the surface gloss.

The keel consists of two plastic halves with a wooden filler block. After the pieces are glued together, the shell is filled with five pounds of lead shot. As I usually sail in light winds, I used



Multiplex rudder servo and Ace Model 91 receiver. Sail servo hidden under output arm.



Cutaway Multiplex R/C aircraft retract landing gear servo with sturdy all metal gears, makes excellent sail servo.

one pound less ballast than the plans called for. The ballast is held in place by filling the cavity with fiberglass resin. Do not use too much catalyst, as when the resin hardens, excess heat may be generated, which could deform the plastic. I set my keel in a tall can of water to prevent any problems with the heat generated as the resin hardened.

The hull is molded in one piece and requires the addition of two molded bulkheads. Again, I used epoxy to bond the bulkheads to the interior of the hull. From past experience, I know that using too much of the solvent type plastic adhesives will cause ripples or soft spots on the exterior of the hull.

Carefully cut the opening for the wooden keel spar in the hull where marked and trial fit the keel to the hull. When you are satisfied with the fit, glue it in place. Remember to scuff up the area with sandpaper. The keel must be aligned vertically as well as fore and aft. This means NOT TWISTED or cocked to one side. Time spent at this step will pay off in the maximum performance of the boat.

The rudder assembly and installation was well documented on the plans and presented no problems during the building. Just remember to keep the rudder straight and aligned with the keel when gluing the rudder support block to the hull. You do not want the rudder to be out of alignment. A rudder that is not aligned with the keel creates extra drag and results in a slower boat speed.

Now is the time to plan for your radio board installation. Included in the plans is a supplemental sheet showing the installation of an Airtronics radio system. I have used this system on several occasions and have had years of trouble free sailing. As I was building this boat for club racing and wanted to keep weight to a minimum, I installed Multiplex servos. Multiplex makes an R/C aircraft retract landing gear servo that can be used as a sail winch. It is light, compact, fast, and extremely powerful. My radio installation uses the Ace Nautical Commander model 91 receiver.

The deck fits onto and over the upper edge of the hull much like a soft plastic lid seals a coffee can. When installing the deck, use masking tape to hold the deck to the hull while the glue sets. This will provide for a good contact and bond with the bulkheads. Turn the hull over and seal the edge of the deck to the hull with plastic cement. Use the glue sparingly, as excess glue will soften the plastic and cause wrinkles along the seal. This seam must be watertight.

The mast, club, and boom are made from sitka spruce supplied with the kit. Before you start to shape these parts, I strongly recommend that you lay out, mark, and drill the holes shown on the plans, as it is easier to drill a hole into a flat surface than into a round one. Normal wood working procedures are used in shaping the mast to a tear drop cross section. I used a thumb plane and sandpaper to achieve the suggested shape. The finished parts are protected with spar varnish or polyurethane.

The standing rigging is fabricated from the stainless steel wire provided. Close attention must be paid to the dimensions shown on the plans so that the side stays turn out to be the same length. Minor differences in the length of the stays can be compensated for by adjusting the screw eyes on the deck.

The finish on this boat was obtained by wet sanding the hull with 200 grit wet/dry paper, then 400 grit, and a final sanding with 600 grit. All sanding was done wet, with frequent changes of rinse water. Two coats of automotive acrylic lacquer primer (spray can) was applied with wet sanding in between with 600 grit paper. Two coats of School Bus Yellow were then applied. Acrylic

The Tahoe at various points of sail, showing excellent form. Comes with complete suit of dacron sails.

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lacquer from an auto parts store was used. The first coat was wet sanded with 600 grit paper prior to the final coat of color. After the final coat had cured for a week, the hull was lightly rubbed out with automotive polishing compound. The hatch cover was painted a different color for visual recognition using the same technique.

SAILING

The TAHOE II was first tested in moderate to heavy winds. It proved to be very responsive to rudder input. As with most 36/600 class boats, it has a very short turning radius. A dual-rate rudder control on the transmitter is a nice feature to have when sailing the TAHOE II. It makes for smoother sailing by eliminating the tendency to over control with the rudder. The boat was set up with the initial adjustments according to the plans. The boat tracked true and required only minor rudder input to maintain a straight course during changing winds. The boat possessed no bad habits and was fun to sail. The Multiplex servos were capable of handling the heaviest winds encountered without strain.

SUMMARY

The TAHOE II is one of the lowest cost boat kits available today that can be used in AMYA regattas. At a cost of $74.00 plus $4.00 shipping, it offers an opportunity to try radio controlled sail boating at an affordable price. Victor Model Products also offers a two-channel radio with sail winch for under $100.00. The boat can thus be built and sailed for under $200.00, including the radio system. It is easy to transport in the back of the smallest car and makes an ideal entry level boat for yourself or as a gift for a family member. Performance of the boat may be enhanced in light air conditions by making a suit of Micafilm sails (see Winter '88 issue) and increasing the sail area to the 600 square inches allowed by AMYA rules. •

Scuttlebutt . . . *Continued from page 22*

range of scale wood kits, mostly of balsa and mahogany veneer. They emphasized their scale fittings kits which were of cast lead, and with proper finishing could greatly add to the scale appearance of the model. Many of these models were large enough to be fuel or electric powered and accommodate the large R/C equipment.

Octura was the first company to develop a full range of propellers and propulsion fittings which made possible the start of practical racing as we have come to know it today. Along with Dumas and a few smaller manufacturers, Octura developed boat kits and accessories which are the basis of the present day racing classes.

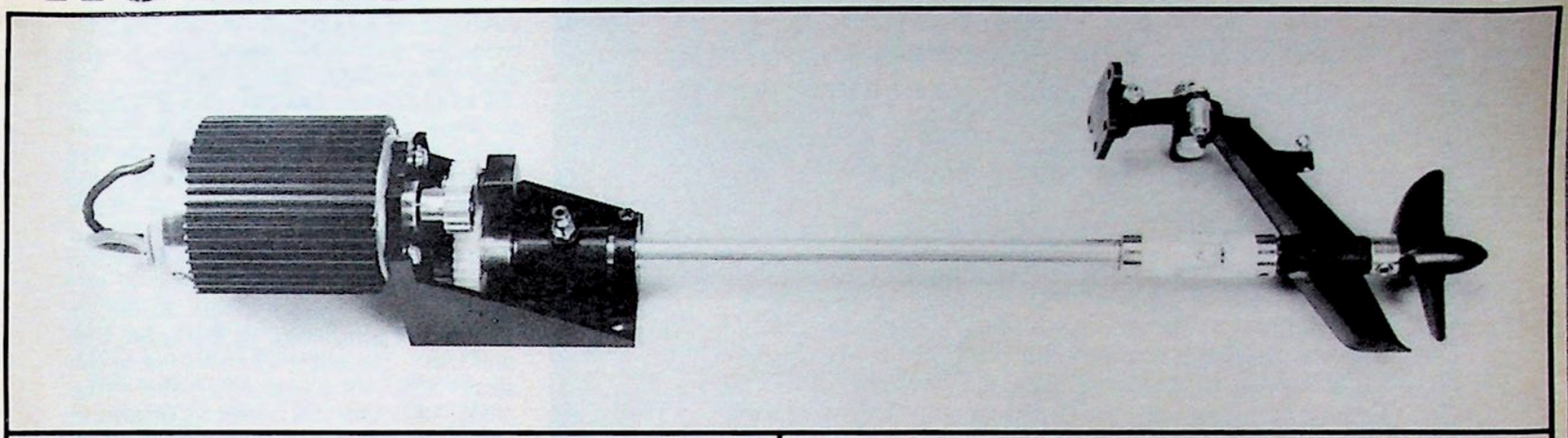
Fiberglass was becoming a common material in full-scale boating and soon found a place in R/C models. Most of the early hulls were heavy and poorly molded but techniques soon improved. Performance boat hulls were the most practical place for this material, as it could be very strong for its weight and molded to very intricate shapes. The process is slow and expensive, as a rigid cavity mold must be built and each hull "laid up" by coating the mold with wax for easy releasing of the finished product, and then coating with liquid resin which will become the finished surface. Then fiberglass cloth or strand are laid in and coated with more resin. Wood motor mounts or bracing structures are often built in. Then the whole structure is allowed to chemically cure or harden. As you can see, this is an involved and time consuming process even with today's advanced materials and techniques.

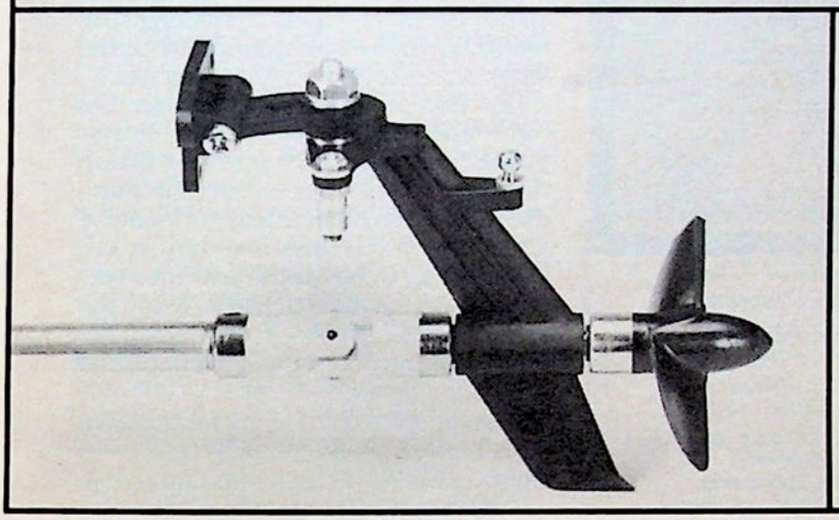
All during this time, we were seeing the development of the modern construction method that is common today. Vacuum molding or vac forming, as it is commonly called, has made possible most of the wide range of scale and performance boats we have. A mold shaped very close to the size and contour of the finished hull or boat component must be made. The mold should be of machined aluminum or a poured aluminum molding epoxy, in order to hold up for a reasonable production run. Plastic sheets of the appropriate thickness are heated until pliable, and are then drawn and pulled tightly against the mold by vacuum. When allowed to cool and harden, they can be removed and then trimmed to the desired edge shape. Molds for vac forming are less expensive and more easily modified than the injection molding described above. Almost any shape seen on a full scale boat can be duplicated by vac forming as the same engineering considerations are involved in fiberglass and vac forming.

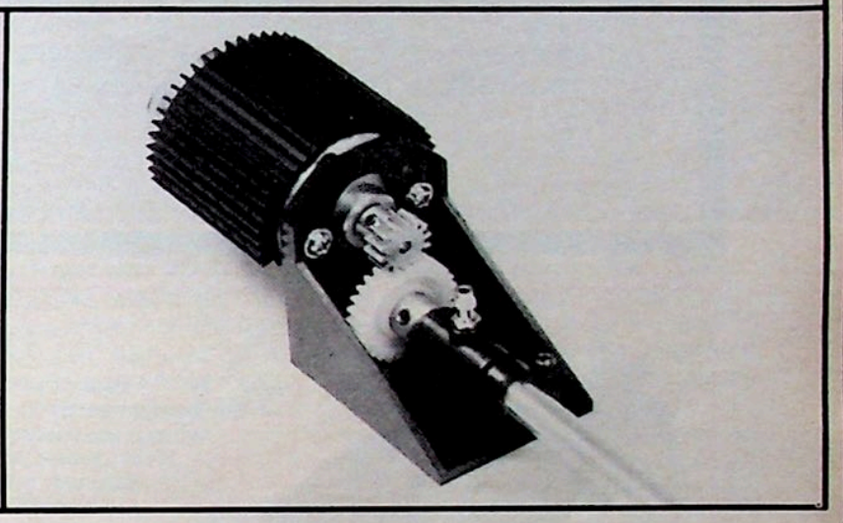
Early vac formed kits by Bonner and Berkley are sought after by some collectors. Although crude by today's standards, they showed what could be done thirty years ago!

The next time you wander around the hobby shop, have a little more appreciation for what you see in those kits. Perhaps thirty years from now you will be looking back at some of today's kits as the ancestors of that future breakthrough! •

HOW TO MAKE YOUR BOAT FLY.







Boats don't usually have wings, but everyone loves to see them fly. To give your boat some flying lessons, TRAXXAS™ has made available the complete VILLAIN IV™ outdrive assembly as a separate unit. This surface drive has all the features that even the most exacting boat modelers demand. The VILLAIN IV running gear allows both the propeller and rudder to turn together as a single unit for instant steering response. For even more excitement, an impressive rooster tail is thrown as the surface-piercing props unload! Other features include:

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PT Boat . . . . . *Continued from page 14*

as shown on the plan and glue into place. Fill in any gaps between the turret base and the cabins.

Cut three identical pieces to the outline of the front cabin side as shown on the plan. Mark and cut out for the windows. Take one of these pieces and cut it straight back from the top of the lower control area to remove the cockpit armor plate from this piece. This will become the right cabin side. The other two pieces will be used for the left cabin side and the middle support.

Cut a piece of 1/4-inch balsa and a piece of plywood to the width of the cockpit floor shown on the plan. The balsa piece should be about one inch longer than the length shown on the plan, while the plywood should be long enough for you to cut the cockpit floor, cockpit forward wall, cockpit control panel, and the cockpit front armor plate from it, insuring that they will all be the same width. Glue the cockpit floor to the base and mark off the locations of the cockpit forward wall and the entrance way length on it.

Glue the left cabin side and the middle support to the cabin base. Glue the cockpit front armor plate in position to square up the other pieces to the base. Then glue the cockpit forward wall and the cockpit control panel into place.

Cut two filler pieces to hold the right cabin side to the middle support and glue them into place. Set the filler pieces far enough apart so that when the front cabin is cut out for the front turret base, they will be clear of the cut area. Glue the right cabin side into place. Cut a piece for the right entrance way armor plate and glue into position. This piece should be the same height as the cockpit armor plate and wide enough so it will be flush with the right cabin side. Cut a couple of pieces of plywood for the control panel searchlight platform and glue into place.

Cut the front cabin top to the outline as shown on the plan and glue into place. As there is no front view on the plan, the two pieces for the cabin front should be cut to the bottom width shown on the top view of the cabin and the height of these pieces should be the length shown on the side view of the cabin. Fit these pieces so that the center joint is perpendicular to the cabin top, and the angle at the center joint is the same angle as the front of the cabin sides. After they are correctly fitted, cut out for the front windows, making sure that the windows are parallel with the top of the pieces, and glue into place.

Cut two pieces of plywood for the right and left entrance way armor plates. Soak them well, and then clamp them to a round object about the same diameter as the armor plates should be when dry. While they are drying, cut pieces of plywood for the entrance way floors and glue them in place. When the armor plates have dried, fit them to the cabin and the floors, sand to shape and glue into place.

Use the 2-1/4 inch tubing for the front turret base as a template to mark and then cut out the area on the right cabin side for the turret base. Glue into place and fill all voids.

Cut and glue into place the armor plate and the seats in the cockpit area, as well as the left searchlight platform. The radio antenna support was made from a piece of 1/2x3/4-inch wood cut to length. Cut, fit, and glue the pieces for the ammo boxes, shield box, side box, and the hatch covers that will go on the rear and middle cabin tops. These hatch covers (and those that will go on the forward deck) were made from a piece of 1/8 plywood used for the top and a piece of 1/16 plywood used for the under piece. The between-cabins vent was cut from a piece of 1/2-inch wood.

The mast is made from 3/16 dowel with 3/32 brass rod used for the braces. A 3/32 brass rod is also used for the no-fire ring of the 20mm gun. On my model, this no-fire ring serves also as the handle with which I raise the superstructure.

The two twin .50 cal. machine gun mounts were made from 1/4-inch plywood, by using hole cutters of the proper size. Cut 1/8-inch pieces from the leftover 2-1/4-inch tubing and use for the gun rings. A piece of 1/8 plywood is used for the gun mounting plate.

The no-fire rings for the machine guns were made from 1/32 brass rod soldered to 1/16 brass rod used for the

no-fire ring stanchions. The guns shown were made from some leftovers from a plastic kit, although since that time, they have become available from Dynamic Models. The 20mm gun, the life raft, the torpedo tubes and the mufflers were made from the kits for these items also available from Dynamic Models.

This completes the construction of the superstructure subassemblies and everything should be ready for final assembly and finishing.

FINAL ASSEMBLY AND PAINTING

Fill, seal, and sand the superstructure components and the superstructure deck to fill all voids and seams. Paint those places that might prove difficult to reach with paint later on. The only paint used on this model (except that used for highlights) was a gray primer that was close to the Navy gray desired.

Layout the location of the front and rear/middle cabin assemblies and glue them into place on the superstructure deck. Make sure that the cockpit floor and the entrance ways fit flush to the middle cabin. To eliminate any space between the cabins and deck, add a molding in these areas.

Drill two holes in the superstructure deck and one in the rear cabin top and glue the no-fire ring into place.

Drill four holes in the rear cabin top for the ventilators and glue into place. These can be made operational if you desire, to provide fresh air to the motor.

Glue the ammo boxes, shield box, side box, and the between-cabins ventilator in place.

Layout and drill holes in the middle cabin top for the mast and glue into place. Cut two strips of 1/32x1/8 spruce for the hand rails and glue them into place, along with the two hatch covers on the middle cabin top.

Paint the superstructure and the other accessories that will go into the superstructure, such as the searchlights, portholes, horn, lights, siren, etc. When the accessories are dry, glue them into place.

Glue the prepainted machine gun assemblies on to the turret bases, and the superstructure is complete.

Sand and seal the rear access hatch cover and glue onto it the 20mm. gun assembly, a hatch cover, and the cleats. Paint and set aside. Fill, sand, and paint the hull assembly gray. Mark off the waterline, and paint below this line with a reddish color.

Paint the mufflers black and glue to the stern with the exhausts just above the waterline.

All of the hull accessories that will

Continued on page 54

TURN HEADS.

WET BIKE (Order No. 1070)
Enjoy model boating like never before. Surprise everybody at your lake with this most unique watercraft. Fast, stable and full of excitement — just like the real bike. Length: 23½", height: 17¾". List price $169.95, **now only 149.95.**

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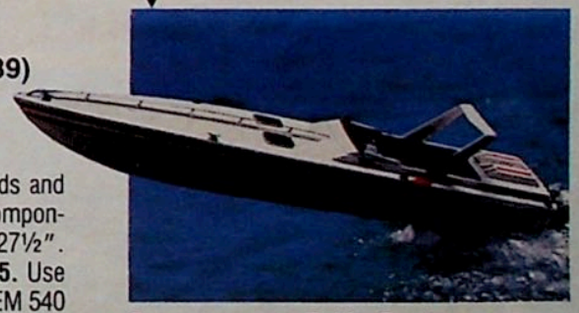

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Enclosed is my ☐ check ☐ money order payable to Robbe Model Sport, Inc.

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INTERNATIONAL HOBBIES' ICBM

By JERRY DUNLAP . . .

International Hobbies is certainly a name that should be familiar to our magazine's regular readers. Over the past couple of years, product offerings from I.H. ranging from offshore catamaran to 3.5cc tunnel have appeared as topics for "Product Surveys." All previous I.H. boats featured in reviews were powered by 2-cycle outboard glow engines. The featured boat of this "Product Survey," however, incorporates a 2-cycle gasoline Echo 22cc weed trimmer motor as the power source.

Although I have been around radio controlled model boating for a quarter of a century, the International Hobbies ICBM Deep Vee is only the third gasoline powered model I've reviewed. If advertisements in model magazines are any indication, it would appear "weedeater" powered models are definitely gaining an inroad in model boating. I believe there are a couple of good reasons for growth in this facet of our hobby.

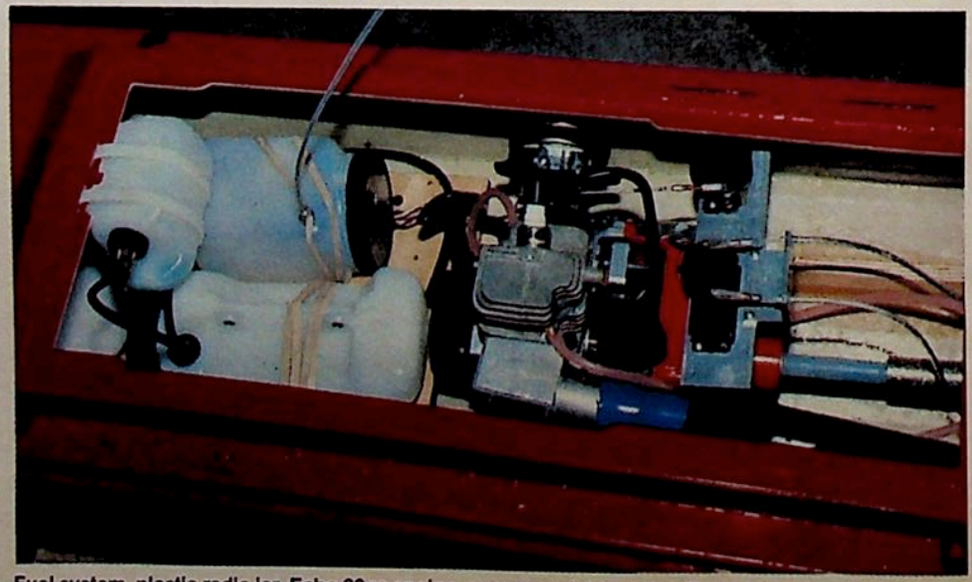
First, the gasoline "weedeater" motor, or chain saw, or blower motor, or whatever the engine's commercial use, makes an excellent power source for general purpose model boating. My experience with gasoline engine applications in model boating has proven these engines to be very easy to start, with low cost operation as an added feature. With the price of competition glow fuel going for over $20 a gallon, it's rather nice to run all day for under $2 with a gasoline/oil mixture. The onboard recoil starter eliminates the need for an electric starter and 12-volt battery. The ignition system does away with the need for a glowplug battery or glow driver as required for starting 2-cycle glow engines.

The second reason for growth is the recent increased availability of boats and accessories intended strictly for the "weedeater" type powerplants. Just a few years ago there was hardly anything readily available in the way of drive systems and motor mounts for this type of power. I know the last "weedeater" boat I reviewed (probably five years ago) was rather primitive compared with the ICBM from International Hobbies.

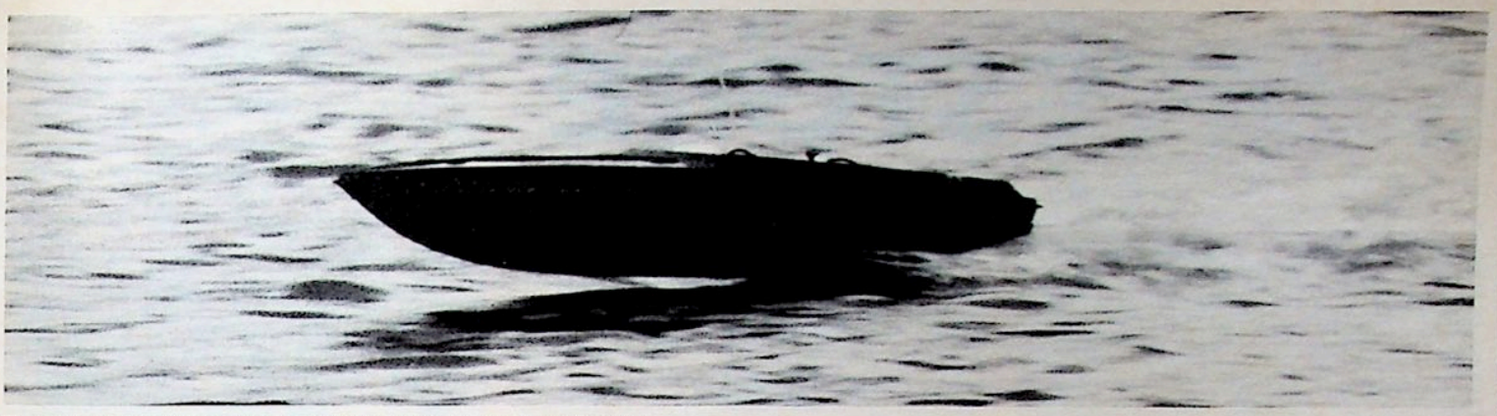
This particular type of model boating would be particularly appealing to the person interested in having a model boat capable of operating in a large body of water like a lake or bay where water conditions are often too choppy for most model boats. The ease of operation and maintenance would definitely appeal to those looking for a form of model boating where enjoyment of running a model and not ultimate speed are the goal.

The deep vee design has become the design of choice of those marketing "weedeater" type of model boats. This is a most logical choice, as the vee hull was developed to operate in rough water conditions. The vee hull also easily accommodates the larger engine size of the "weedeater" powerplants.

Well, enough of this generalizing about "weedeater" powered model boats. Let's take a closer look at International Hobbies ICBM. The 47-inch overall length of the ICBM places it on the smaller side of most "weedeater" type hulls. Compared to the vees I'm most familiar with, the boat seemed plenty big. It certainly has more than sufficient room for engine, drive system, radio, and fuel tanks. Although the basic hull was designed with the intention of using the Echo 22cc industrial engine, I think it would work very well with a .90 glow engine or even twin .67



Fuel system, plastic radio jar, Echo 22cc engine, servos, and drive tube. Engine is water-cooled and Magic Muffler keeps down the noise.



The ICBM from International Hobbies at speed, coming off a wave.

glow engines. The ICBM's scale appearance is very noticeable to anyone with a smattering of knowledge about full size deep vees. Fellow model boaters who have seen the boat have commented positively about the appearance of the ICBM. The peel-and-stick graphics trim helps accentuate the overall appearance.

Like all other model boats from International Hobbies, the ICBM is of fiberglass construction using a process known as resin transfer method or RTM. In the lay up technique, the fiberglass material is placed in a male mold and then a female mold is pressed into position to "transfer" the resin into the glass.

The version of the ICBM I received would probably be considered the kit version. The tasks I needed to perform were: installation of the outdrive unit, mounting the motor to the motor plate, installing the motor in the hull, connecting the drive train, positioning the fuel system, attachment of the ride plates, and placement of the radio equipment. A full set of directions and diagrams are provided to assist in these installations.

Although I didn't keep a tremendously accurate accounting of time, I don't think more than five or six hours were required to install the requisite systems. All the required holes in the hull for mounting the outdrive, ride plates, and motor are pre-drilled. The different components are individually bagged to make identification and installation easier. Just basic tools were needed to complete assembly of the various parts. Compared to the last R/C car I attempted to assemble, the ICBM was "a piece of cake."

International Hobbies offers completely assembled versions of the ICBM for those who would rather run than "wrench" a little. Anyone interested in having a "ready-to-run" or finding out more about the boat should, contact the company directly.

I didn't encounter any "glitches" in the assembly phase of the ICBM. My advice to anyone assembling the kit is to take the time to familiarize yourself with the various components then read and follow the directions and diagrams. Make sure all the bolts are securely tightened, because gasoline engines, like glow engines, do tend to vibrate.

One interesting difference I encountered while installing the radio system was the use of a plastic jar to house the receiver and receiver battery pack. Mounting the steering and throttle servos in aluminum stock material and bolting this to the motor housing is also a change from what I'm accustomed to in smaller vee radio installations. The distance of the steering servo from the receiver required the use of an aileron extension to make the connection.

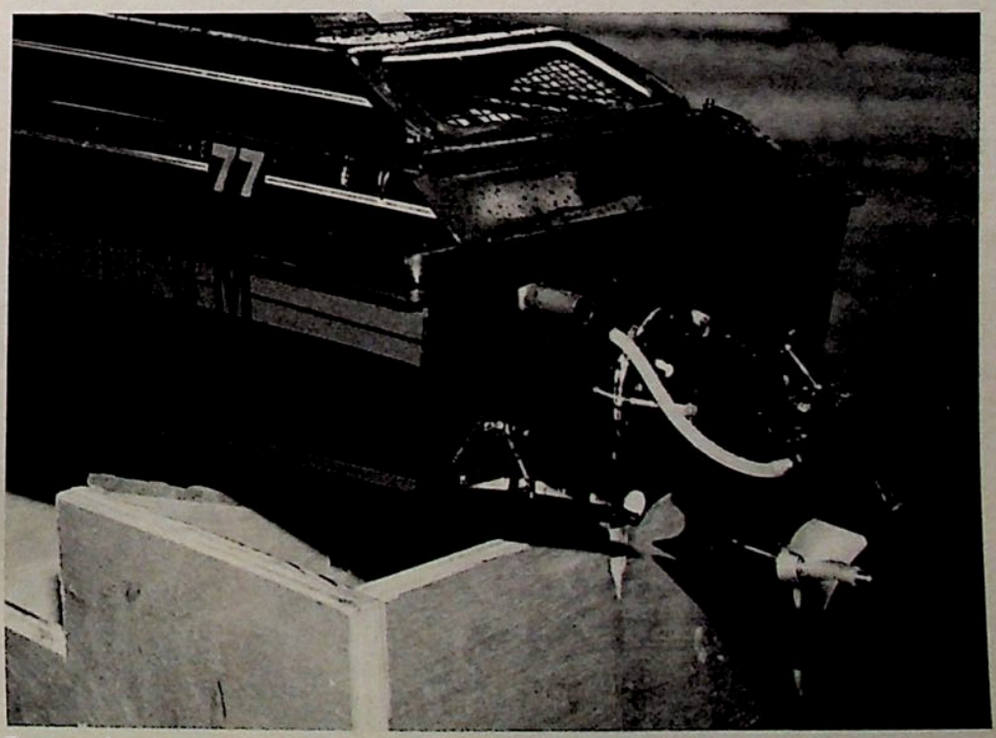
The Saturday on which the ICBM was initially run would have been considered a terrible day for model boating. The wind was blowing 15 to 20 mph and the water was pretty choppy. But it was ideal water for the ICBM. For the first run, the ride plates and outdrive were positioned parallel to the keel. These settings provided a "glued down" ride even on the choppy water. The outdrive is easily adjusted using a Bonditus 6-32 allen wrench and the turnbuckles on the ride plates were turned in to pull up the plates. With the ride plates pulled up and the outdrive kicked back approximately 5 degrees, a much more positive running attitude was obtained.

I would estimate the top speed at a little over 20 mph. The boat turned well in either direction, but favored a right turn due to the torque of the prop. The propeller I was using was an Octura X457. I tried a X455/3, but this prop wouldn't take a bite. I plan to try a X460, because the engine has a "ton of torque" rather than high RPM.

Even though the ICBM didn't have the speed I'm accustomed to while running competition type boats, I really enjoyed running the boat. On this particular day, I couldn't have run any of my competition boats because the water conditions were much too rough.

I did attempt to "lean-in" the engine and found the original setting as it came

Continued on page 69

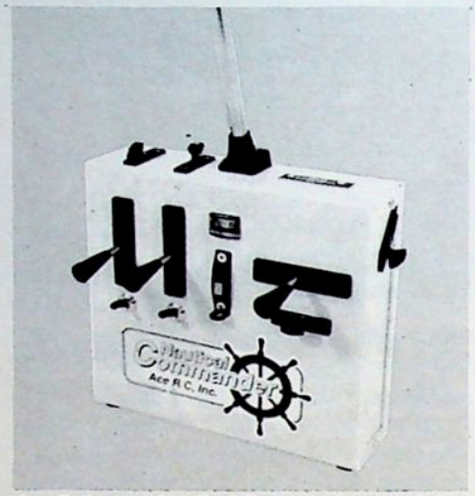


Transom view shows International Hobbies Outdrive, ride plates, and Magic Muffler exhaust stinger. Octura X457 prop provides the push.

SHIP'S STORE

All material published in "SHIP'S STORE" is quoted or paraphrased from press releases, furnished by the manufacturer and/or their advertising agencies, unless otherwise specified. The review and/or description of any product by USBSM does not constitute an endorsement of that product, nor any assurance as to its safety or performance.

Ace Deluxe 7-channel Nautical Commander.



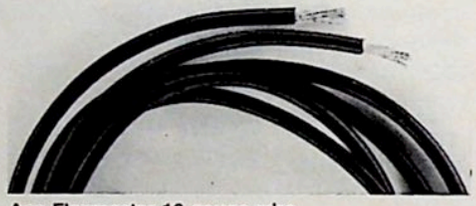
Ace 7-channel Nautical Commander.

Half-inch scale crew from Hartman Fiberglass.

Ace R/C, Inc., 116 West 19th St., P.O. Box 511, Higginsville, MO 64036, phone (816) 584-7121, FAX (816) 584-7766, has a bunch of new items . . some especially designed for model boating.

First is the PS1210, 12-Volt Power Switch. This is a power switch that is intended to replace a typical servo-operated mechanical switch, for operating auxilliary functions such as lights, horns, anchor winches, etc. It handles 10 amps continuous and a 30-amp surge, and will switch from 2 to 30 volts. You'll need connectors to hook up to your receiver and power system.

Next, Ace is offering a 1991 Video Tape. This tape gives you the straight poop on the frequency phase-in plan and the status of old and new radio equipment, by Tom Runge; a run-through of all the technical aspects of "Narrow Band Transmitters" and "Dual Conversion Transmitters," by Fred Marks; and AMA's viewpoint on the whole mes . . er entire subject, by Technical Director Bob Underwood. Total running time of the VHS tape is about two hours.



Ace Flexmaster 16 gauge wire.

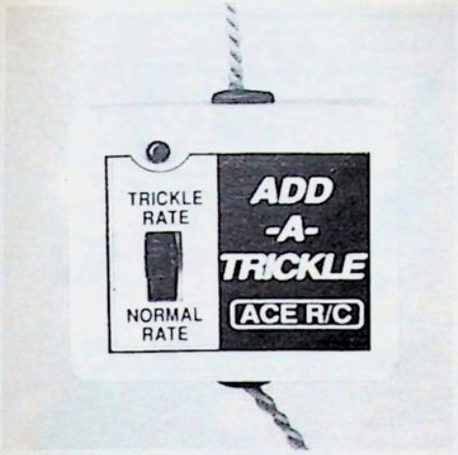
To enjoy the full power output of your batteries, Ace recommends the use of its Flexmaster 16 Gauge wire. This extremely flexible wire is made up of seven ropes of 95 strands each of #44 copper wire, or 653 strands all together! The juice from your batteries will meet very little resistance as it flows through *this* main pipeline! The wire comes in 24-inch lengths, with red and black insulation.

Ace Auto-Trickle Digipace retrofit.

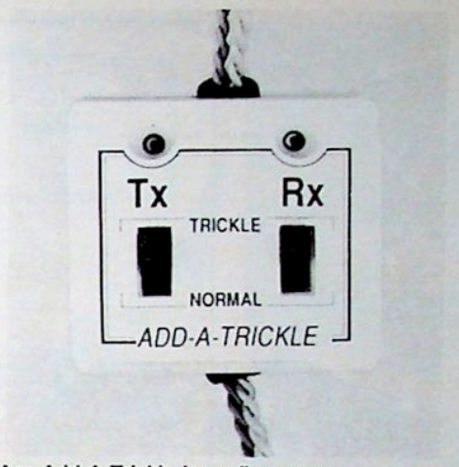
The Ace Auto-Trickle, designed by Fred Marks, allows your present charger to automatically switch into trickle mode. You can hook your batteries up to the charger and forget them, as they'll automatically switch

Ski Tiger from Parma International.

Follansbee Hydro by Parma International.

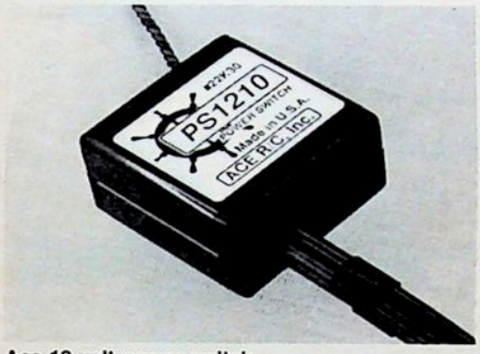


Ace Add-A-Trickle for any charger.



Ace Add-A-Trickle for radio system.

AC/DC 6-7 Cell Charger from Astro Flight, Inc.



Ace 12-volt power switch.

to trickle when fully charged and can stay there until you're ready to use them . . two days or two months later! The unit may be added to your charger, or retrofitted to the Ace Digipace I, making it the ultimate in battery maintenance systems.

The Ace Nautical Commander now has a channel for every day of the week! Two new non-proportional switched channels have been added to the system in the form of toggle switches mounted directly under the two throttle sticks, giving a total of three neutralizing proportional channels, two lever-action proportional channels, plus the two new channels . . seven in all.

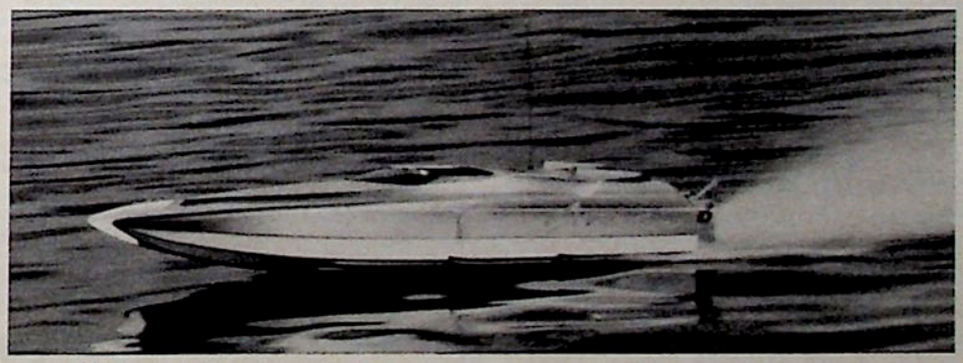
The Deluxe version of the Nautical Commander has also been promoted to seven channels. This unit, with dual RF decks to cover both the 75 and the 27 mHz bands, and 800 MAH batteries throughout, with the transmitter batteries being removable for quick change, has it all! The Nautical Commanders, with regular or Model 91 receivers, range in price from $179.95 to $249.95 retail.

Ace's ET1210 Electronic Throttle is a solid state unit ideal for most sport or scale electric boats using 1.5 to 30-volt systems. It provides fully proportional forward or reverse speeds from zero to full throttle, handling 10 amps continuous and 30-amp surges. As it hooks directly to your receiver, not requiring a servo to operate, you will need to furnish your own connectors for the receiver, battery, and motor system.

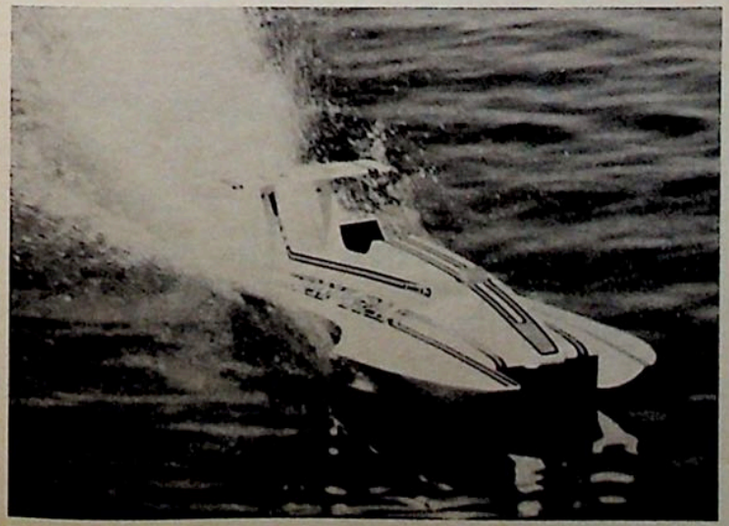
Finally, the Ace Add-A-Trickle allows you to add a trickle charge feature to any existing overnight charger. Unlike, and also considerably less expensive than the Auto-Trickle, the Add-A-Trickle must be manually turned on after the overnight charge cycle is complete. The batteries will receive a safe, slow, trickle charge of about 10ma, which can be left on indefinitely, meaning your battery pack is always ready for immediate, full-power action. The unit comes in either a Single or Dual setup to match your charger's output.

* * *

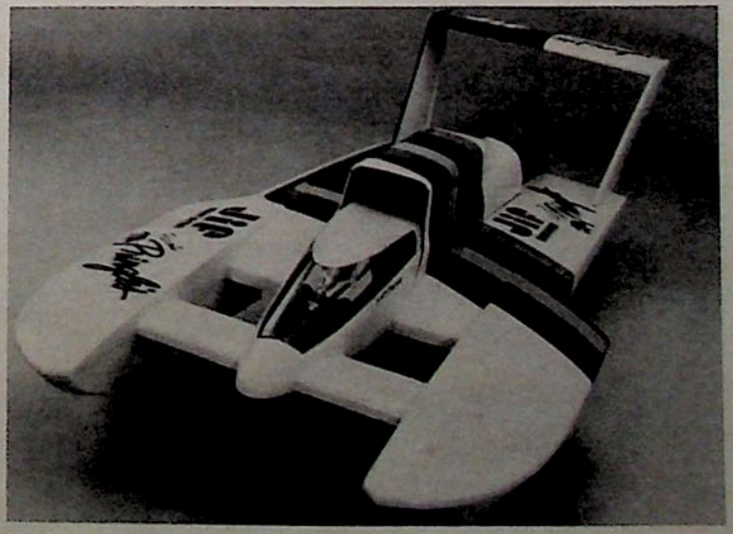
While your radio system batteries are getting all charged up with Ace, you may want to give your electric power batteries the same kind of deluxe treatment. Astro Flight Inc., 13311 Beach Ave., Marina Del Rey, CA 90292, phone (213) 821-6242, offers the Model 114 Six/Seven Cell AC/DC Charger



Dumas Skater 67 racing catamaran.

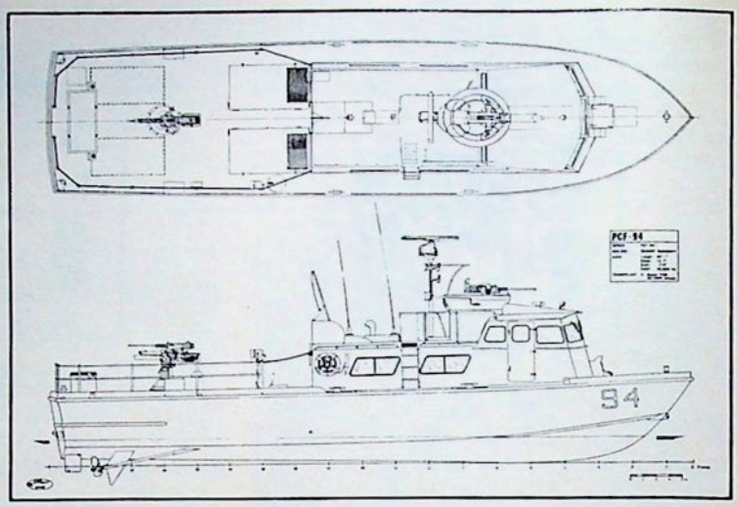


Dumas Pay-N-Pak, 1/8 scale Unlimited.



Mr. Pringle's electric hydroplane by MRP.

Wet Bike from Robbe Model Sport.



PCF-94 from Dynamic Models.

Ace Video Tape on 1991 radios.

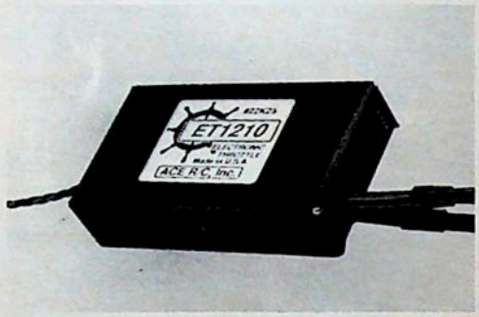
for this kind of service. With no complicated adjustments to confuse the beginner, you just plug it into your six or seven-cell NiCd pack and set the timer. The Model 114 works on 110-volt AC house current or from your 12-volt DC car battery. It charges all six and seven-cell NiCd racing packs from 1200 mAh to 4000 mAh. Charging times for six and seven-cell packs are a fast 15 to 25 minutes, and it will even charge the big 4000 mAh truck-size packs in just 45 minutes.

You could nickname this charger the "Hot Plate," as all the heat generating components are mounted directly on the face plate. This allows the face plate to get very hot to the touch during charging operations, but because the heat of charging is dissipated through the face plate, it is not necessary to let the Model 114 cool down for 15 or 20 minutes between charges, as with most other chargers. To test the reliability of these chargers, Astro Flight ran six of these units at a full five amps continuous load 24 hours a day for 30 days with no failures!

* * *

Rob Brandon of Dumas Products, Inc., 909 East 17th St., Tucson, AZ 85719, phone (602) 623-3742, FAX (602) 620-1329, announces two new racing boats for .67-size engines. The "Skater 67" is a 40-inch LOA stand-off scale model of the 32-foot long original. With a narrow 13-3/4-inch beam, it is very fast on the straightaways, yet suffers almost no deceleration in the turns. Three steps and two strakes in each hull reduce drag and improve overall performance.

Hull and deck of the Skater are hand laid-up fiberglass; joined and finished in white gelcoat. Factory installed engine mounting rails are ready for the Dumas 5-inch motor mount. Pads are already drilled and tapped. The Skater



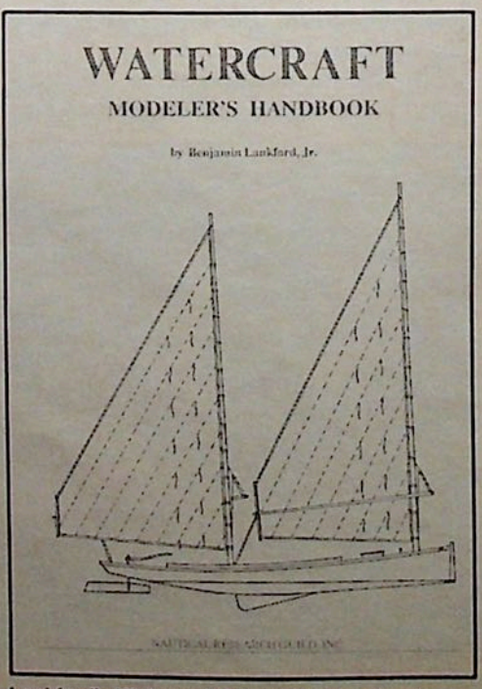
Ace Electronic Throttle.

kit is stock number 1436, the running hardware kit is No. 2352, and the Dumas waterproof radio box is No. 7031.

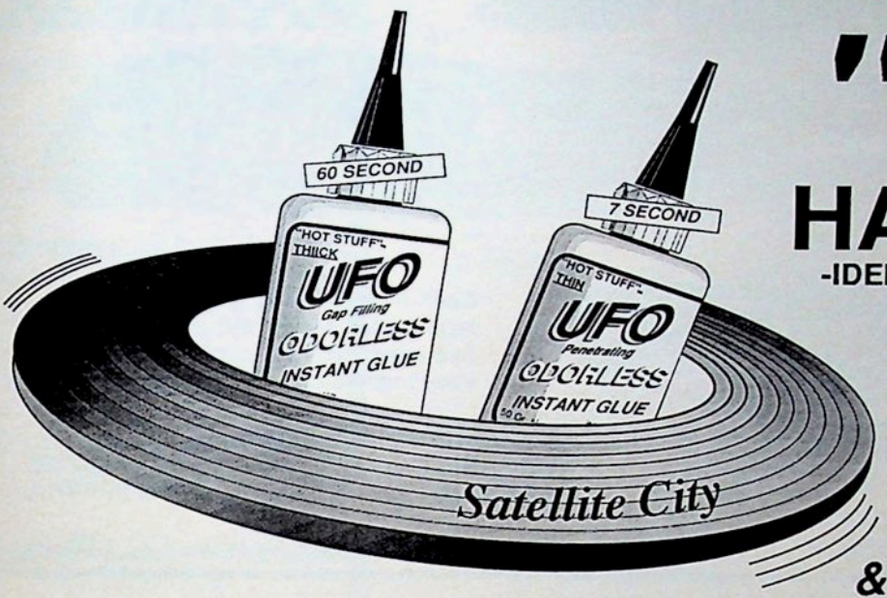
The second offering from Dumas is a 1/8-scale model of the "Pay-N-Pak," Unlimited Hydroplane, which went on to race as the Atlas Van Lines U-76, and later as the "Miss Madison." The kit can be painted and detailed as any of these boats, although the P-N-P decals are included with the kit. Length of the model is 43 inches, and the beam is 22 inches.

Constructed of cleanly die-cut birch

San Remo luxury yacht from Robbe Model Sport.



Lankford's Watercraft Modeler's Handbook.



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-IDENTIFICATION HAS BEEN MADE -

MODELERS WORLD WIDE KNOW THAT
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"UFO"™
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- *HAS NO ODOR*
- *DOESN'T FOG PLASTIC*
- *FOR ALL MODELING USES*

& "UFO"™
- *BONDS WHITE FOAM WITHOUT PRIMER*

IS THIS REALLY TRUE ???

Out of the thousands of calls and letters we've received about "UFO"™ , many of you asked "Is this really true?", or "Will it really bond foam"?. Although we understand that a product that is User-Friendly, Oderless and Bonds White Foam is revolutionary, the "Is it really true"? questions , opened our eyes to the fact that many of you didn't believe the ad. And, if this was the case how many of Satellite City's other ads, over the years, have some of you seen as just so much hype? **Let's set the record stralght.**

When Satellite City advertises:

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"HOT STUFF"™ products are the only Instant glues used on the *"Voyager"*

"SPECIAL'T™ was tested by Scale R/C Modeler and found to be TWICE AS STRONG as the next best hobby Instant"

""HOT STUFF"™ products are the BEST INDUSTRIAL GRADE"

"UFO"™
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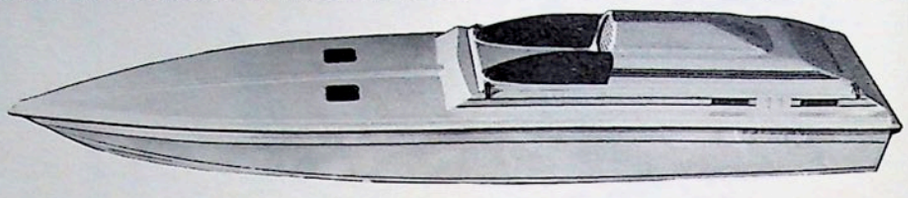

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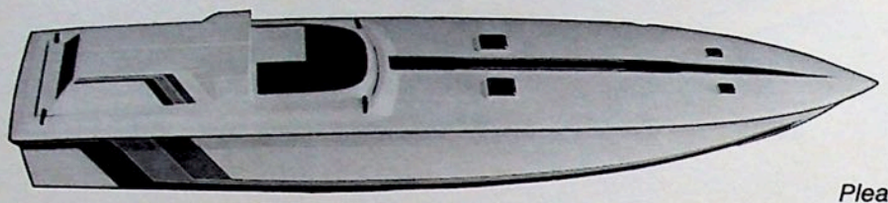

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and mahogany plywood in the traditional manner, the Pay-N-Pak kit is No. 1324, the running hardware kit is No. 2346, and it's designed to accept the five-inch Dumas/Steve Muck engine mount. When ordering, specify the engine you will be using, as the engine mount will be drilled and tapped to fit.

* * *

Dynamic Models, Drawer C, Port Jefferson Station, NY 11776, phone (516) 928-8200, announces the release of the "PCF 94 Swift." This is the third in a series of Vietnam Riverine Craft from Dynamic, the others being the "PBR" and "Nasty." The 3/4"=1'-scale boat is offered in a three-piece fiberglass semi-kit which includes the 37-inch hull, the cabin, and forward gun turret, along with highly detailed, full-size plans drawn by Coastal Forces. The semi-kit retails for $159. Dynamic also furnishes the fiberglass hull for the PT boat featured as a construction article in this issue.

* * *

Hartman Fiberglass R/C, Box 86, 233 Melrose St., Argenta, IL 62601, is offering a set of nine crew members in 1/2-inch scale for its popular Harbor Tug, the "Douglas Greg" (see ad in this issue). To make sure they're kept busy on their days off, Dwight Hartman now offers a fiberglass hull and deck for our "Big Bunker Boat," which at 60-inch LOA, is also 1/2-inch scale. No rest for the weary!

The cast metal crew comes unpainted, but for 50 cents extra, a color photo is included to help you with the paint job. Some of the arms come detached, but are easily assembled with plug-and-socket connections and a little cyano glue.

* * *

MRP (Model Racing Products), 18676 142nd Ave. N.E., Woodinville, WA 98072, is now offering the "Mr. Pringle's" Unlimited Electric Hydroplane, as a running mate to its "Miss Budweiser." These boats are powered by two special-wind 05 electric motors driving a high performance

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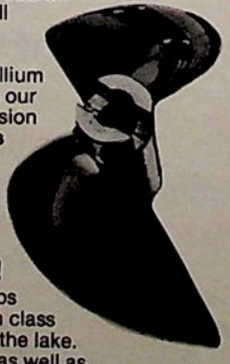

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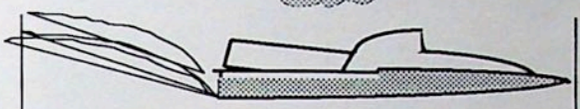

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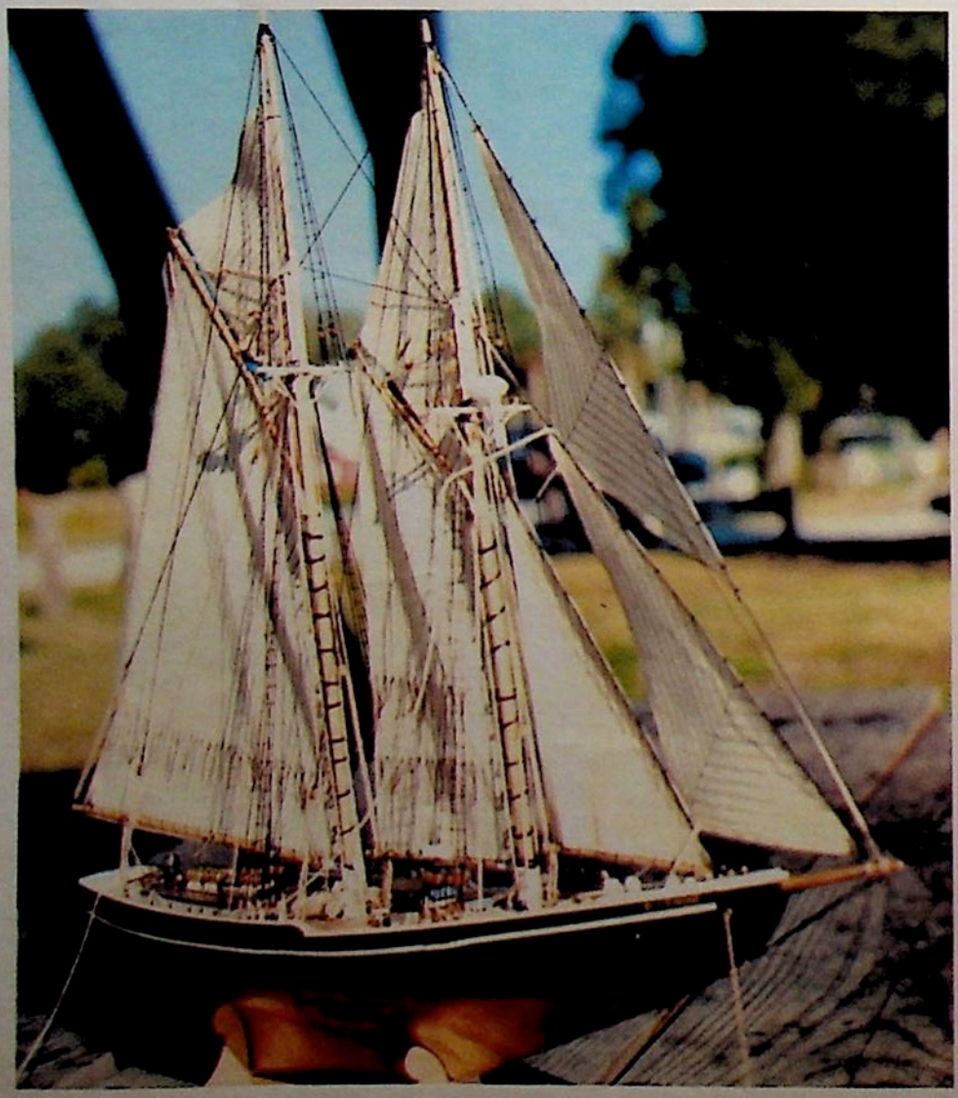
BLUE NOSE II

a billing boats kit

By TIM MILLER . . .



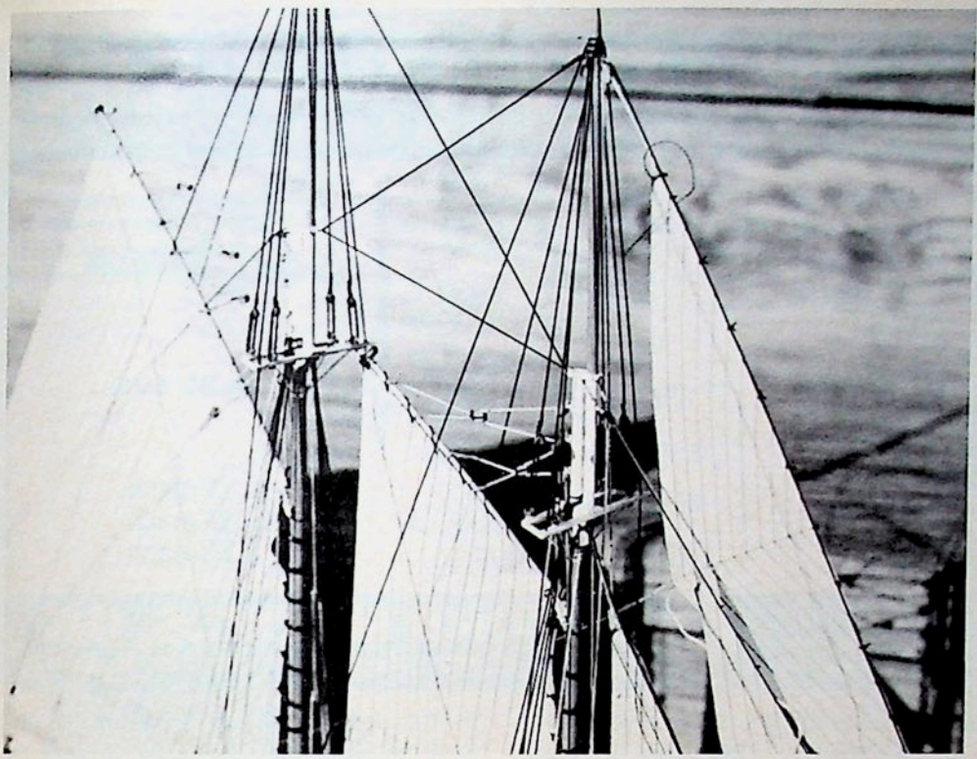
The fishing schooners that worked the Atlantic Ocean off the New England coast at the turn of the century were some of the most highly refined and dangerous sailing machines ever built. From the lofty schooner rig and yacht-like hulls to the distinctive Gloucester keel, the boats were built for speed; often the first boat back to port with her hold full of fish would receive the best price for her cargo.

As steam and gasoline put an end to the age of sail, the fishing schooners disappeared from the harbors, no new boats were built to replace those that were lost or rotting away. Canada was one of the first countries to see the need to recognize the historical importance of these vessels and the men who sailed them by building a replica of one of the old schooners.

The Bluenose II was launched in 1964 to serve as Canada's maritime ambassador to the world and is a replica of the fishing schooner *Bluenose*. The original Bluenose was built in 1920 to race in the International Fishing Schooner Races and was only lightly fitted for fishing. She dominated the series and was destroyed on a reef near Haiti in 1946. While Bluenose was built to race, Bluenose II was built with the stipulation that she never be raced. Her job is to show Canada's rich maritime history to the world.

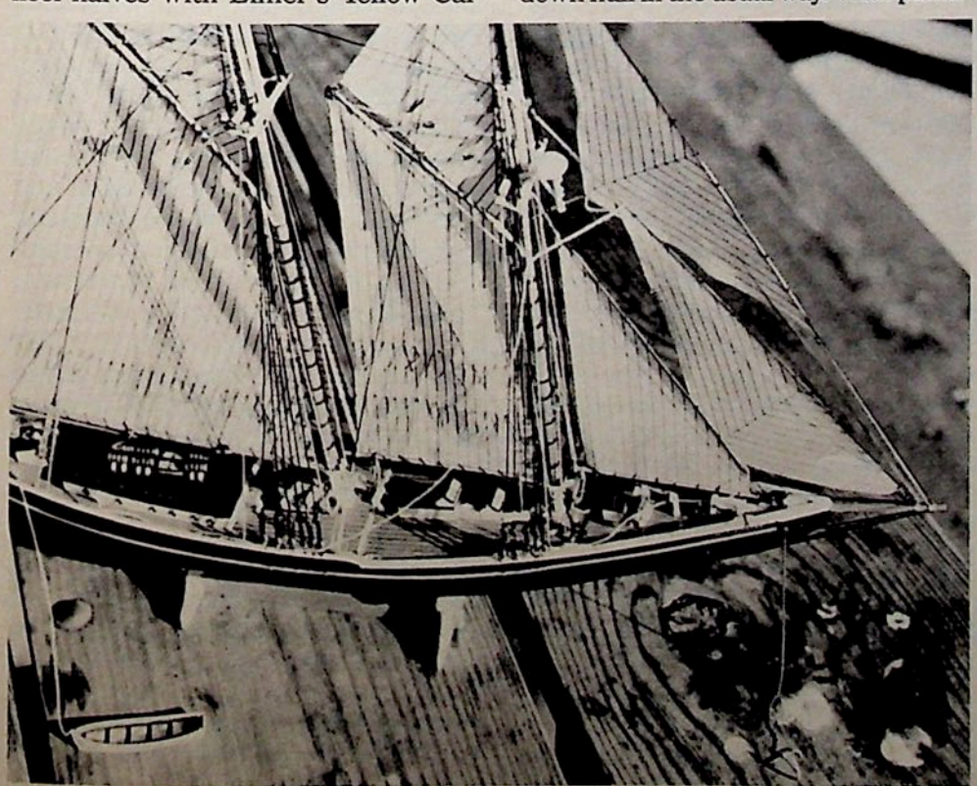
The Bluenose II kit by Billing Boats of Denmark, now imported in the U.S.A. by International Hobby Corp., 350 E. Tioga St., Philadelphia, Pennsylvania 19134, (215)426-2873, builds into a very nice model for static display. Built at 1/100 scale, the model is 21 inches long overall and 18 inches tall. The materials were neatly packaged and nothing was broken or missing. Several plastic boxes contained small wooden parts, brass fittings, and a multitude of small deadeyes and bolts. The frames and other plywood parts were cleanly die-cut and punched out easily. The strip wood used for planking was cleanly cut and there was plenty of it. It's basswood, I think.

The instructions didn't have the same quality as the materials in the kit, it doesn't take long to read the instruction booklet. The text was too brief and the pictures were fuzzy and didn't show much detail. The instruction booklet was only useful in showing the assembly sequence. The full size drawing was nicely done with one side showing the sail plan and deck arrangement and the other a plan for the spars and rigging. There are no explanations or sketches of details on the plan and it seems like a lot of information has been left out. Modelers with a bit of experience will be able to figure out the plans but be-



ginners may have difficulty. A trip to the library or book store will clear things up. I used *The American Fishing Schooner* by Howard Chapelle for information about the real boats, and *Ship Modeling From Stem to Stern* by Milton Roth for modeling information.

The picture on the box clearly shows how the plank-on-bulkhead hull is built. The hull is split down the center line and built as a left and right half, neat idea. I used an 18-inch square of 1/2-inch plywood as a building board and mounted the left and right keel pieces on it with thumb tacks. The frames and decks were added to the keel halves with Elmer's Yellow Carpenter glue, then each half planked. I made a simple jig on the edge of the building board so the planks could be tapered with a sanding block. The planking was ended at the dashed line marked on the keel, contrary to what the instructions showed. A drawing of *Bluenose* in *The American Fishing Schooners*, shows the keel to be 12 inches wide. The two keel halves of the model scale to 15 inches, so adding planks below the dashed line would make it too thick. Having the hull halves lying on their sides put them at a convenient angle for working on, it seemed easier than planking an upside down hull in the usual way. With planking completed, the two half models were sanded and glued together, than sanded again, filled, primed and painted.



While waiting for the glue to dry on the hull, the cabin and deck furniture was assembled with cyanoacrylate glue. The parts for the rails were sanded and painted and the masts assembled and painted.

Adding the rails, cabin, companion ways and other small parts to the hull made the model look almost finished. It was now ready for the fun part. . . rigging. This is where the instructions could have been a lot better by explaining, with text or drawings, details such as lacing deadeyes, attaching stays and shrouds to the mast and attaching the pulleys. If you know how to do these things, there is no problem. If you don't, head for the library or book store and you will soon be learning how.

Rigging and sails took up about half the time spent on the model. The line provided in the kit seems a bit heavy and awkward appearing, so I substituted a slightly smaller size nylon line from my scrap box for stays and shrouds. White glue was used to "sew" the folded hem of the sails, the reef points sewn through and secured with a tiny drop of glue. The rat lines were also sewn through and glued. Running rigging from the kit was used and looked good. The anchors, radar, lights and a small crew of H.O. scale railroad figures, were added to finish the model. The brass parts weren't painted to show off these finely made pieces.

I was well pleased with the kit and the finished model. It's a pretty boat and I enjoyed building it. The kit is a good one for detailing beyond what the plans intend, because most modelers will find themselves using the extra reference books. Ship modeling requires more reading than most other hobbies.

Whether built under full sail, with sails furled, bare poles, or even as two half models (one to keep, one to give as a gift), the Billings *Bluenose II* kit is an attractive model requiring only a small space for display. The builder is in for a pleasant building experience and will learn a lot about ship modeling in the process.

Billings Boats-NR 600 kit, Bluenose II.

Ship Modeling From Stem to Stern, Milton Roth, TAB Books Inc., Blue Ridge Summit, Pennsylvania. The Dromedary Ship Modelers Center, 6324 Belton Drive, El Paso, Texas 79912.

The American Fishing Schooner, 1825-1935, Howard I. Chapelle, W.W. Norton and Company, New York. •

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surface prop, fed by twin 7.2-volt stick batteries. A new metal rudder now provides greater durability and even better control in the turns. Three kit forms are available: The 10-2014 Mr. Pringle's is the ready-to-run version, complete with two-channel pistol-grip radio installed, ready for decal application. The 10-2015 Mr. Pringle's has the deck and hull joined, motors, and high-amp microswitch speed control included. The 10-2016 is the unassembled kit requiring electric motors and speed control.

* * *

Parma International Inc., 13927 Progress Parkway, North Royalton, OH 44133 (Order $2.00 catalog direct; see your dealer to make purchases), has put its vast background and experience as a slot and R/C car kit and accessories manufacturer to use in developing two new R/C electric powered racing boats. First to appear was the Ski Tiger, reviewed by Dave Frank in our Fall 1988 issue. It is a modified vee design that features a surface drive for superior speed and handling. Available in three kit versions; Basic, Deluxe, and Supreme, the retail prices range from $79.50 to $189.50. It comes out of the box in white and requires no painting.

Parma has now followed up with a second electric powered racing boat, a 1/10-scale model of the "Follansbee Hydro." Featuring the same molded Lexan construction as the Ski Tiger, it is also available in the same three kit versions as the Ski Tiger.

The Ski Tiger is also available in a very basic kit (No. 20016, $39.50) containing the unpainted hull, deck, radio/motor compartment, and deck cover. This allows the custom boater to "roll his own," choosing equipment and paint scheme to suit his fancy. As with the R/C cars, the Lexan parts are painted on the inside, providing a highly polished, scratch-resistant finish. All of the Parma boats, cars, and even aircraft models are available at your local full-service hobby dealer.

* * *

Are you ready for this!? The latest in watersports is now being offered in R/C model form by Robbe Model Sport, 180 Township Line Road, Belle Mead, NJ 08502, phone (201) 359-2115, and will have been seen in live demonstrations by those lucky enough to attend the IMS Atlanta show in mid-May. It is called the "Wet Bike," and that just about describes it. The driver sits astride the bike much like it would be done on a motorcycle. The rear ski rides low in the water until you accelerate, and then planes, even at low speeds. The forward ski is linked directly to the handlebars, and is used mainly for steering.

The Wet Bike kit includes all molded bike components, including the driver, plus shock absorbers, electric motor, gear set, stern tubes, shafts, counter-rotating props, servo saver, and hardware. A two-channel radio is required, along with the Robbe Rokraft 100 speed control and a six-cell NiCd battery pack. Length is 23-1/2 inches, height 17-3/4. Crazy!!

For the more conventional boater, Robbe offers the "San Remo," a semi-scale luxury yacht. With lots of fittings, exotic woods, and a swim platform, this 27-1/2 inches long by 8-3/4 beam vessel is very realistic. It is driven by electric power (Robbe Navy Speed motor and Rokraft 100 FET speed control recommended) using a six-cell NiCd battery pack. Kit includes molded hull, deck, cockpit, and cabin, fittings, R/C hardware, and decals.

* * *

Of special interest to scale modelers, the Nautical Research Guild, 6508 Dorset Dr., Alexandria, VA 22310, offers the *Watercraft Modeler's Handbook*, by Ben Lankford, Jr. This 8-1/2 x 11-inch paperback contains 165 pages, 61 black-and-white photos, and 139 line drawings, and is priced at $18.50 plus $1.25 postage, checks and M.O.s made payable to the Guild.

The book specializes in the research and model building techniques for constructing models of small watercraft up to about 70 feet in length. It emphasizes plank-on-frame building, and covers such models as ships' boats, lifeboats, work boats, fishing boats, whaleboats, crab boats, oyster boats, sponge boats, canoes, rowboats, and river pleasure boats. A list of the chapters pretty well describes the contents; Sources of Information, Materials, Tools, Model Construction Methods, Keel and Stem Construction, Shell Construction, Fiberglass Construction Methods, Shell Framing and Decking, Rigging Details, Fitting and Rigging Installation, Hull Details and Accessories, and Finishing.

With so many subjects to cover, none can be dealt with in total detail, but certainly the author gets you off to a good start and heads you in the right direction to accomplish what you are after. •

PT Boat . . . . *Continued from page 43*

now be added should be painted before

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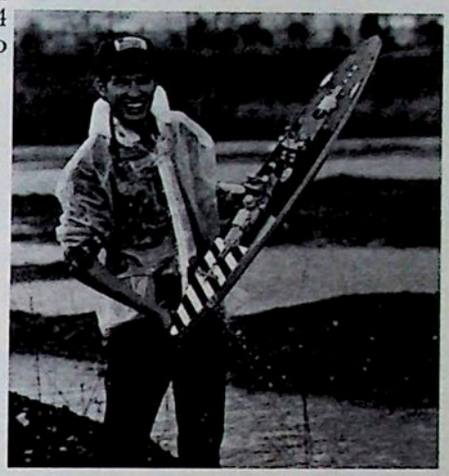

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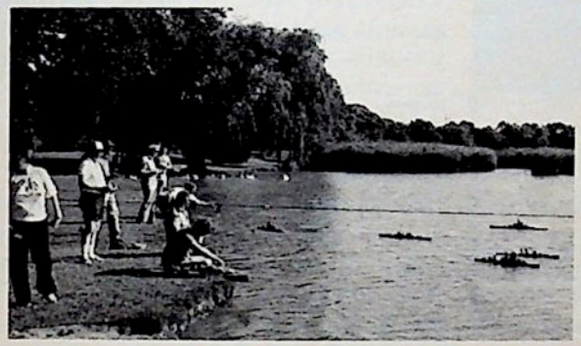

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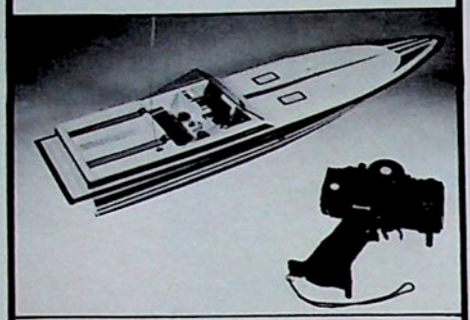

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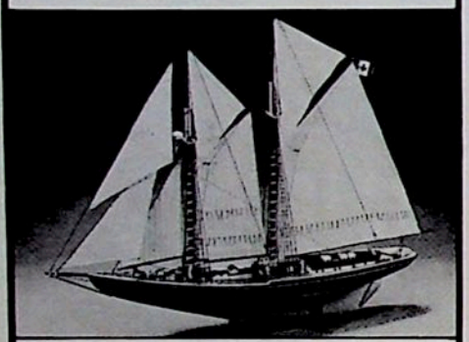

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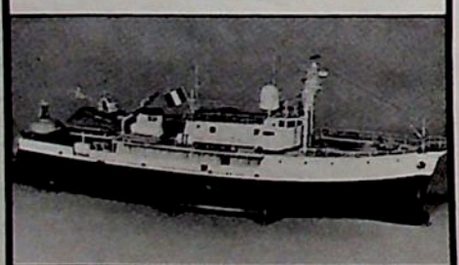

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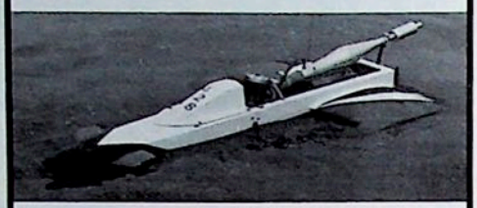

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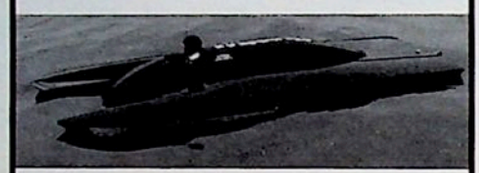

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they are glued to the deck.

Drill holes and glue the front ventilators in place as shown on the plans.

Drill the three holes near the stern and glue the stanchions into place. Use 1/32 brass rod for the railing.

Drill the four holes for the bow stanchions and glue them on. Use the 1/32 brass rod for the railings for these, and extend the railing at the superstructure and through the deck. This will be used for the radio antenna, as explained later on.

Glue into place the front hatch covers, cleats, flagstaff and the bullards.

Cut four 1/4-inch square blocks and use them for the life raft supports. Glue them and the life raft into place. Glue the four torpedo tube assemblies into place.

Spray the entire hull assembly, superstructure and rear access hatch assembly with a coat of flat polyurethane clear. This not only will give your model a hard durable finish, but will help hide any errors that may have sneaked in while painting. If you have never used this material for a final finish, try it, you may like it.

Install your radio gear. Set the rudder arm so you will get the maximum throw on the rudder. If you are using electric power, use an electronic speed control to extend your battery life.

Solder the receiver antenna to the front handrail to use it as your external antenna. In doing this, you will leave your superstructure free of any internal attachment in order to gain fast and easy access to the hull interior.

With everything completed, batteries charged, it's off to the lake and watch the water fly! Happy running. •

Shipwright . . . *Continued from page 19*

tioned. No consideration was given to difficulty; a charming but simple solid model of a West Coast logging tug competed against a full-rigged clipper.

The historical accuracy (or inaccuracy) of a model was only a minor factor, so awards were given to two models which fall in Chapelle's category of "Models Which Should Not Be Built" (because no one knows what the ships looked like). Also, the judges were given no information by which to gauge historical accuracy beyond their own experience.

THE BIG SHOW

This country's most prestigious display model competition is sponsored by the Mariner's Museum, Newport News, Virginia, every five years. A very different set of rules is used, newly modified for the 1991 competition. The categories are organized by degree of handwork and ship type: Scratchbuilt models of sailing ships, of powered ships, and of small craft; Semi-scratchbuilt (incorporating parts by others) of sailing ships, of powered ships, and of small craft; and Kits, without subdivision.

There are a number of special awards for models of steamships, navy ships, and ships built by Newport News Ship and Drydock. Perhaps the most challenging is the Howard I. Chapelle Memorial Award for the best original historical research; an extensive brief or paper must accompany the model.

The criteria to be used by the judges are also announced:

General Impression 10%
Level of Difficulty 20%
Scale Fidelity 20%
Craftsmanship 30%
Research by the Modeler 20%

Here the emphasis is on craftsmanship (50% of the score) and historic content (40%), with encouragement to try unusual subjects. The judge can look forward to a real learning experience.

Good construction practices are a prerequisite to entering, but craftsmanship still far outweighs creativity and expressiveness in the scoring. The general level of accomplishment in this competition is high enough to look beyond issues of manual dexterity, to the

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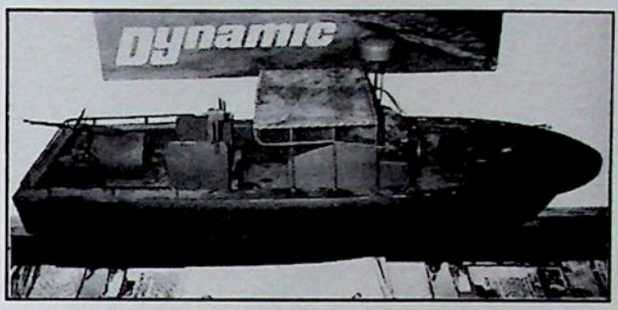

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next goals for ship modeling.

The experience of the last Mariner's Museum competition raises an important but unwritten point. As in the *Constitution* Guild competition, three judges worked together to decide by consensus. Since complete objectivity is no more possible than a complete vacuum, and no one judge can be experienced in all the diversity of models for which one hopes, the exchange of different viewpoints can only produce better decisions.

Interestingly, none of the judges in that competition are model builders either; they are curators and historians. One doesn't have to have built to know how it is built, or how it should look. All three have Navy backgrounds, however, and the number of Scratch Sailing Ship entries depicting naval vessels exceeded most entire categories. No coincidence here, emphasizing the need to select judges for diversity as well as for expertise.

A MODEST PROPOSAL

To be constructive, criticism must present an alternate vision. Here is a proposal for ship model competition rules containing some new ideas and some old ideas; most could be incorporated into another system.

The competition prospectus should begin with a clear statement of goals, such as applauding the best modeler in the club, or recognizing significant achievement, or recognizing significant improvement at several levels of ability, or encouraging original contributions to maritime history. There should be one primary goal; other secondary goals may be better served with special awards, rather than diluting or muddying the flow of the competition.

The prospectus should also outline the history and makeup of the sponsor, and the expected composition of the body of the competitors. Not only will this clarify the thinking of the rules committee, but it will also ensure that sponsor, judges, and competitors are all on the same wavelength.

Numerical awards (first, second, third) can be dispensed with. If the level of competition is high enough to make competition worthwhile, then these distinctions at the top become arbitrary. The number of awards for a category can be pegged to the number of entries:

Continued on page 59

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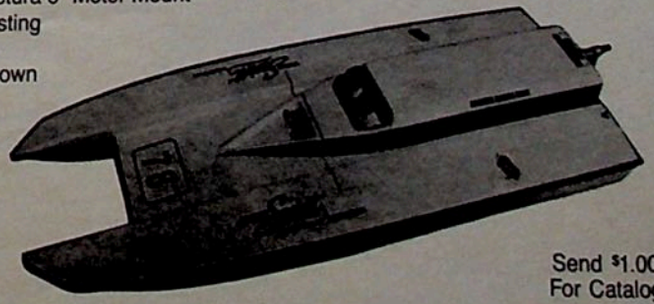

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BOOKS
IN REVIEW

By PETER SHREEVES . . .

I've always suspected that model boat builders spend more time reading about ships than they do building models. I know it is true in my case, even though I consider myself an active modeler. The two activities go hand-in-hand, as research helps model building and models are educational in themselves. The models I build give me a great deal of pleasure and the book collection I've built up over the years is a constant source of pride and enjoyment.

Perhaps, as you are reading this column in a magazine, you are like many individuals who enjoy reading but have not yet expanded the experience by browsing through book stores or pouring over catalogs from mail order book outlets. Books, after all, are not always inexpensive, and there are so many books and book suppliers that one might wonder where to start. Which books are best for you will be highly dependent on your interests, but there may be some ideas I can suggest.

It is poor strategy to shop in a grocery store without a shopping list, especially so when you are hungry! The selection is so vast that you can find yourself wanting to buy everything without regard to what you really need. A shopping list for books may not be a practical idea, but you shop smarter if you give some thought to what kind of books you are most interested in. This can be a tough exercise for those not accustomed to the cold light of introspection. Choosing an area of concentration can force one to admit not being really interested in some subjects (like: *Ending World Hunger* or *Being A Better Husband*) while confessing to some level of ignorance (like: *How To Use A Hammer* or *How To Tell Ships From Buildings*).

Identifying your subject, and your level of knowledge, is helpful, as all books are limited to some extent. No book can cover all the knowledge there is and, the more broad the scope of a book, the less depth it can have.

The depth of a book also affects where one must look to find it. Books with fairly broad appeal can be found at most bookstores, while more specific books may have to come from specialty publishers or rare book dealers. Chances are a local bookstore will be able to serve all your needs, but sometimes a more specific effort in book shopping will pay off well.

For instance, my father repaired landing craft in the South Pacific during WWII, so I can identify an interest in a fairly narrow set of topics relating to that location and time frame. By looking around, I've been able to find a number of books from a variety of places. Some of the books I've found are: *Allied Landing Craft of WWII* (from the publisher), *MacArthur's Amphibious Navy* (out of print but located through the publisher), *The Pacific War Remembered* (publisher) and *Ships For Victory* (used book dealer).

If a book is in print it can be obtained directly from the publisher or through any good bookstore. Bookstores have microfilm lists of titles in print and will be happy to order a book for you. It can also be helpful to write to the publisher to track down an out-of-print book. Sometimes a publisher will sell the rights to a book to another publisher, or know of someone with a stock of the book. It never hurts to ask!

If a book is out of print you can contact used book dealers who will help you locate it. You can usually find dealers listed in hobby magazines who cater to subjects people are interested in. These are often small outfits that can be very helpful, but it is a good idea to be considerate when contacting them. If they charge for a listing, include the payment and use SASEs with inquiries.

For most model building projects, the builder would like to have the best information he can get about the vessel itself. The most direct information is usually a set of plans, although even the best plans can be augmented by photographs, or the comments of someone who served aboard the ship. Moreover, a ship is part of an historical era, and the model represents more than a miniature of the vessels. Books help to put the vessel into perspective and enhance the experience of building.

For instance, in building a model of a WWII landing craft, *MacArthur's Amphibious Navy* helps me envision the use of the craft as well as helping with diorama ideas. Photos in *Naval Weapons of WWII* gives me greater insight into the detailing of the guns and the way other objects were distributed around the decks. I can trace the design significance of the vessel from *Conway's All The World's Fighting Ships: 1922-1946*, and I can get a feel for the men who served aboard the vessel from *The Pacific War Remembered*. My landing craft project is a rich and enjoyable one, largely due to the ability to locate

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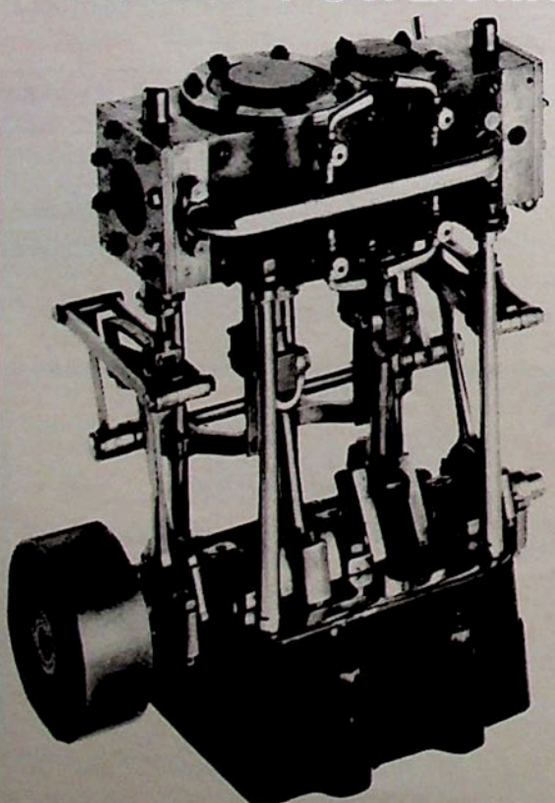

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books.

Other sources of books are the mail order discount houses that send out catalogs. As they have such a wide selection of general interest books, they are seldom a good source for highly specific subjects. They do have an advantage in price, and it is worthwhile reading through their listings. Books of less general interest can find their way into the bargain book section and provide great value for the interested reader.

All in all, books can enhance your hobby and provide entertainment for many years. Book shopping can be as much fun as the hobby itself, and is well worth the small effort involved. Good luck! •

Shipwright . . . . *Continued from page 57*

no award if there are less than five entries, one if there are five to eight, two if there are nine to twelve, etc. The judges should have the option of withholding any award if they feel that the level of competition in the category is not up to the other categories.

On the other hand, judges should distribute Honorable Mentions (or Commendations) liberally, whenever a modeler has achieved something noteworthy. The CONSTITUTION Guild has a "Most Popular" award, decided by vote of visitors to their exhibition, which is always interesting. Their "Best of Show" award is almost always arbitrary and misleading, however, unless the competition is not good.

Great thought should be given to the criteria to be used by the judges. These will vary according to the goals of the competition, but I propose that for historic scale modeling roughly equal weighting should be given to:

Level of Difficulty
Extent and Quality of Research (by the modeler)
Accuracy and Extent of Detailing
Craftsmanship and Finish
Creativity and Character
Presentation (static display) or Performance (RC)

Numerical rating sheets, giving points to each model, are very time consuming and not useful unless: 1) all the models cannot be seen at once or, 2) the ratings will be published or given to each modeler.

Publishing numerical ratings means an enormous amount of work for the judges, each having to go over his work several times to be sure the numbers reflect his priorities, and then again to achieve consensus with the other judges on ranking every model. As a judge, I feel responsible for defending

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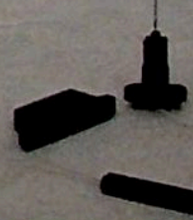

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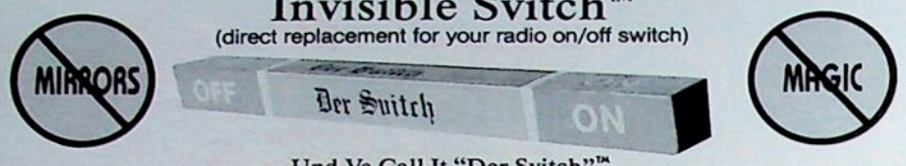

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and explaining my decisions, but usually this is best done in quiet, one-on-one with the modeler. Both judge and modeler can be more open and receptive.

The number of categories should reflect the number of entries expected, extrapolating from the previous competition. A basic distinction should be made between scratchbuilt models and those incorporating any parts made commercially or by another modeler, except chain and cordage. Extra credit for difficulty should be given to modelers who make their own cordage, which is often far superior to that available commercially.

To "level the playing field," separate divisions should be created for professionals and winners of awards in previous competitions (and those wishing to compete in this division), and for amateurs. No further distinction is needed to establish Scratch Models, Master Division as the most prestigious.

If the level of competition allows, I would like to see a distinction made between research from secondary materials (plans for ship modelers, published plans and histories, existing models) and primary materials (original ship's plans, inspection and measurement of the subject by the modeler, photographs and other contemporary pictures, builder's models). Separate divisions could be created if there are enough entries, or a bonus given for primary research if not.

Here we have eight categories already, or four with a primary research bonus. If the number of entries warrants further divisions, it should be by ship type, as in the Mariners' Museum competition, with separate categories for ship-in-bottles and miniatures (defined as less than 12 inches long, and at a scale smaller that 1/190).

The goal of this system of categorization: really, of any system, is to compare models of like kind as much as possible. The more similar the models within a category, the more meaningful the judges' decisions will be. I hope my proposal will be the beginning of more open dialogue about goals in ship modeling as reflected in competitions. In particular, I would enjoy hearing the ideas of judges of radio controlled competitions, and those of modelers with goals I haven't considered.

The most a competition can do is recognize the success of the modeler in achieving his intent and, further, to recognize a particularly worthwhile intent. At the highest level, competitions give us all a chance to applaud the modeler who is significantly furthering ship modeling, with a thought-provoking demonstration of his ideas, and furthering maritime history, with a compelling three-dimensional presentation of original research. In a well-designed competition, there is room for every modeler. •

Waterlines . . . . *Continued from page 21*

formance from that of models and other ships of geometric similarity. His work prompted England to build testing basins to facilitate the design of ship hulls, a practice soon imitated by the other maritime nations of the world. There is no doubt that his work influenced the early aerodynamicists to utilize wind tunnels in their development of aircraft. Too, Froude (pronounced 'frood') was the first to break a ship's resistance into its two components, frictional drag and wave-making drag. Osbourne Reynolds, within a decade of Froude's death, greatly extended knowledge of the frictional component, but Froude's wave drag theory is virtually unchanged today.

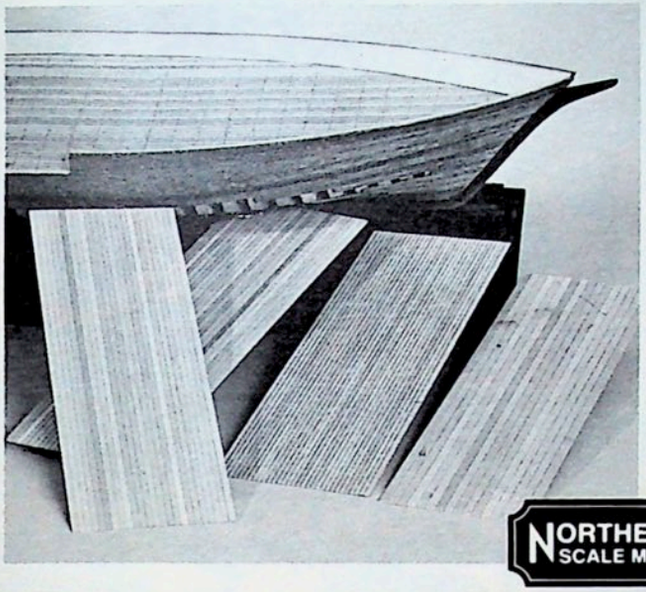
An ocean wave. . . and particularly the waves produced by a vessel's hull passing through the water. . . are rather complex and variable in nature. They may be longitudinal, traverse, or (the most common) orbital. They are subject to gravity, inertia, depth of water, wind, etc. Most of the time the wave equation is but an approximation, at its best when the wave is not breaking in deep water, and it is calm. Most of the time, the parameter, called Froude's Number, holds well when the water is deeper than a wavelength, the wave is moving at or near its terminal velocity, and there is no wind. Wind often introduces excursions in wave amplitude with interference additions and subtractions.

What is Froude's Number? Unlike Reynold's Number, it is not dimension less, which fact we will discuss shortly. Let us derive Froude's Number.

In Figure 2 we see an orbital wave. . . not transverse, not longitudinal. It is formed by a particle on the surface and others within the wave moving in circular paths. At the crest it has a horizontal velocity **V** and a vertical velocity **O**. In the trough it has a horizontal velocity **-V** and a vertical velocity **O**. The orbital velocity equals the wave velocity. The period (seconds per wave) is the distance between crests **L** divided by **V**. Looking at the orbit, which has a circumference of 2 **pi h**, the period **T** is equal to:

T = (ph h)/V or h = (T V)/pi (Eq. 1).

Since **V = L/T (eq. 2),**



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h 5 L/pi (eq. 3).

The acceleration is toward the center and is that of gravity, one **g** 5 32 ft./sec. squared. Therefore,

g 5 2**V** squared/**h**, and V squared 5 **(h g)**/2.

Using Eq.1, **V** squared 5 **(g T V)**/2 **pi**. Dividing each side by **V**,

V 5 **gT/2 pi**.

From Eq. 2, **V** 5 **L/T, T** 5 **L/V**.

Then, **V** 5 **gL/2 pi** 5 **5.12 L** (for **g** 5 32 fps squared and **pi** 5 3.1416).

If **V** is ft./sec. and **L** is in feet: **V** 5 2.26(L) to the .5 power and Froude's Number is 2.26. If **V** is knots and **L** is in feet: **V** 5 1.34**(L)** to the .5 power and Froude's number is 1.34. Obviously Froude's Number is not dimensionless and must be used with care.

Froude's Number is used as a measure of performance comparison between vessels of different, but geometrically similar sizes. Operating at the same Reynold's Number, the same wave action is produced and performance predictions for the proposed vessel may be prepared. It is a powerful tool for the naval architect.

For the model builder, Froude's number is a measure of what his displacement hull can do. A vessel, or model, is said to be at it's maximum speed when its velocity in knots divided by the square root of its waterline length in feet, equals 1.34. At this point, the hull has overtaken its bow wave, and its stern wave has moved aft to a point that is a waterline distance behind. It has also grown in size! If additional power is supplied, the hull will plane, or having dug a hole beneath it to provide water for the great wave looming astern, will sink below the surface. Destroyers have experienced this, their after decks being submerged when at this high speed. It is a very dangerous condition and one requiring care in slowing or changing course.

Another use for this number is as an indication of what relative power will be required. At the maximum Froude Number, great power will be absorbed to build the mountain of water astern. At a speed in knots such that a number of 1.00 or so is calculated, the power required is such that the performance is "comfortable" and is actually a good selection for a cruising speed.

Our wave formula tells us that the wave velocity is: Wave Velocity 5 wavelength / wave period. Our Froude Formula tells us that the maximum velocity of any wave (or speed of a displacement type hull) is: Froude Velocity 5 2.26 (wavelength)(to the .5 power). Let's put these two equations together by setting the two velocities equal. This results in (let's stick to feet and seconds): Minimum period **T** 5 .442 **(L)**(to the .5 power).

Let's say we have a 36-foot waterline cruiser that has a hull speed (Froude Number of 2.26) of 13.56 fps. **T** is calculated to be 2.652 seconds, the time to traverse its waterline length. We want to duplicate this craft at 1/4-scale, or 9-feet. We calculate its minimum period **T** to be .442 x 3 5 1.32 seconds. We continue adding power until we "get it". What is the model velocity? It is 9/1.32 5 6.82 feet per second. What is the Froude Number? It is 6.82/3 5 2.27, which equates to the 2.26 for the 36-footer, allowing for "rounding off" the calculations. This tells us the wave-making drag factors are tracking and are scale, even though the 36-footer is moving sixty-four times the water the 9-footer is pushing out of the way.

A quarter-scale car moving at ten mph is doing a scale forty mph and looks it. An eighth-scale locomotive at ten mph is doing a scale eighty *and looks it*! A model airplane has a different

Continued on page 69

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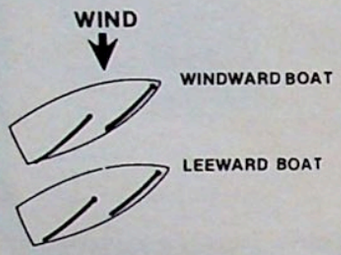
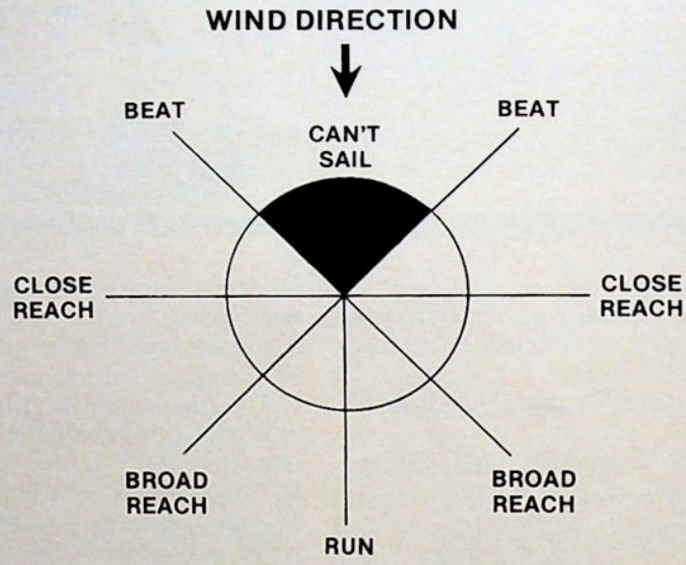
WINDWARD - toward the direction from which the wind is blowing

LEEWARD - away from the direction from which the wind is blowing



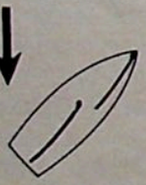
DRAFT - the distance from the boats waterline to the bottom of its lowest point, ***OR*** the depth of the water needed to float the boat!



BASIC SAILING PRIMER - *POINTS OF SAIL*

1. BEATING TO WINDWARD (sailing into the wind)

WIND DIRECTION



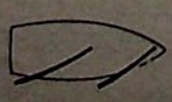
on port tack (sails on right)
close hauled (sails in tight)

on starboard tack (sails on left)
close hauled (sails in tight)

2. CLOSE REACH (sailing across the wind)

WIND DIRECTION

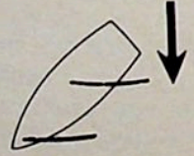
on starboard reach (sails on left)
sheets eased (sails out 25%)



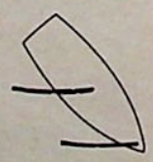
on port reach (sails on right)
sheets eased (sails out 25%)

3. BROAD REACH (sailing away from the wind)

WIND DIRECTION



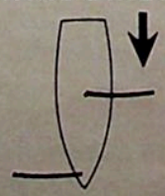
on starboard broad reach
(sails on left)
sheets eased (sails out 50%)



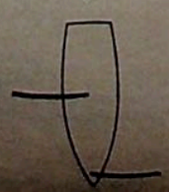
on port broad reach (sails on right)
sheets eased (sails out 50%)

4. RUN (sailing before the wind)

WIND DIRECTION



on starboard run (mainsail on left)
sheets out (sails out 100%)



on port run (mainsail on right)
sheets out (sails out 100%)

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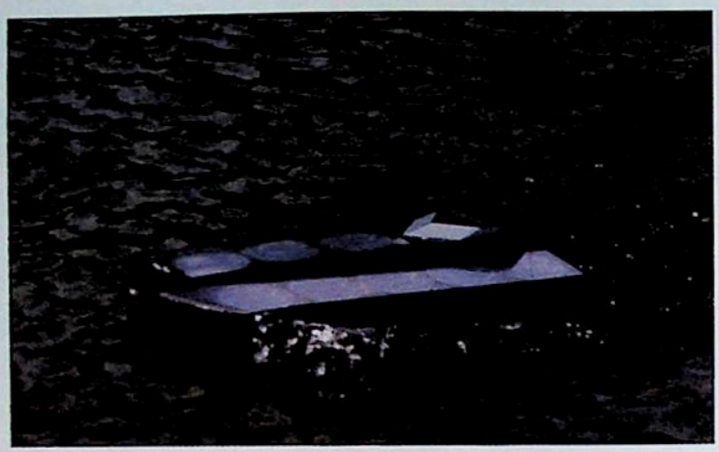
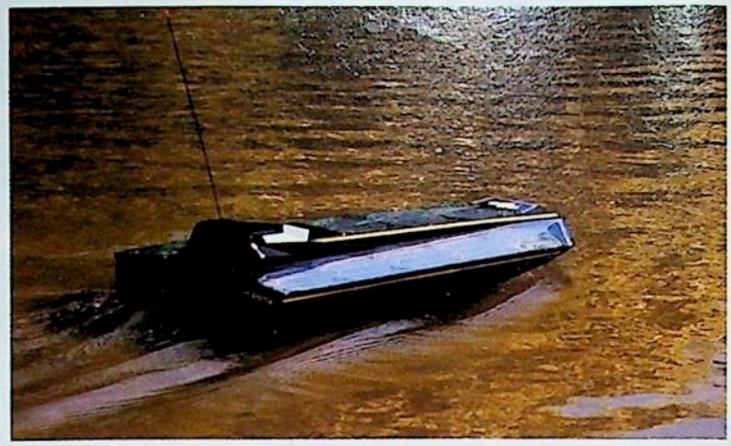




"SOLAR SYSTEM"

SOLAR BATTERY POWERED CATAMARAN

By GRAHAM GOODCHILD . . .

This project demonstrates the potential of using solar cells in a model boat as an auxiliary power source to the main battery supply. I decided that a catamaran shape would give maximum area for mounting the solar cells and, at the same time, provide a design which would be capable of planing performance under battery power.

The solar cells are wired in series and parallel to provide the necessary amperage for driving a standard 380 motor at just 2-1/2 volts. Switching from solar cells to battery is achieved with servo operated micro switches which also double as a two-step speed controller. Switching to solar power starts the boat off at displacement speed, then switching to battery for fast running. Of course the main advantage is that you can cruise all day under solar power alone and at a respectable speed too.

MATERIALS

Hull and Cabin

4 sheets 10cm x 5mm (4x3/16-inch) sheet balsa

6 sheets 10cm x 5mm (4x1/8-inch) sheet balsa

13 No. 0.42 volt 1.8 amp 10cm (4-inch) diam. silicon solar cells

RS 380 motor

33cm (13-inch) propeller shaft and tube

35mm (1-3/8-inch) propeller

Rudder Assembly

Universal coupling

2 No. micro switches

Screw type connectors

Copper wire, cling film, etc.

2 function radio controls

1 servo — steering

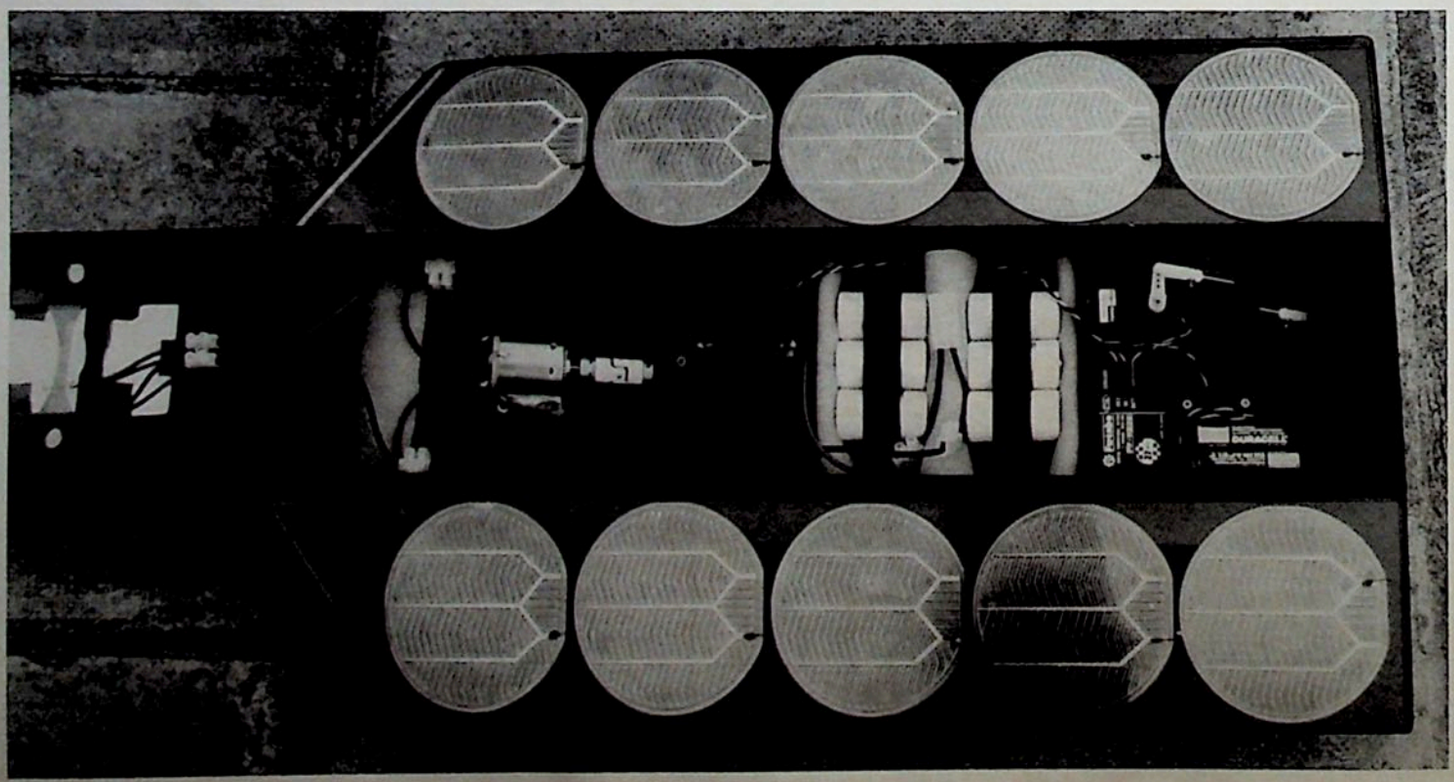
1 servo — solar cell/battery switching

CONSTRUCTION

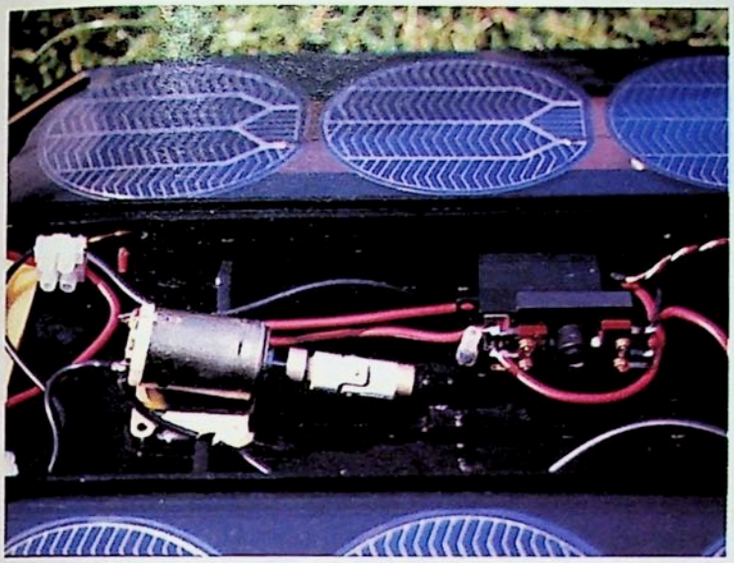
Trace and cut out the parts from the plans.

1. Assemble the 2 hulls and bridge deck frame as shown. Bevel the keels and underside of the decks at the bow to accept the hull sheeting.

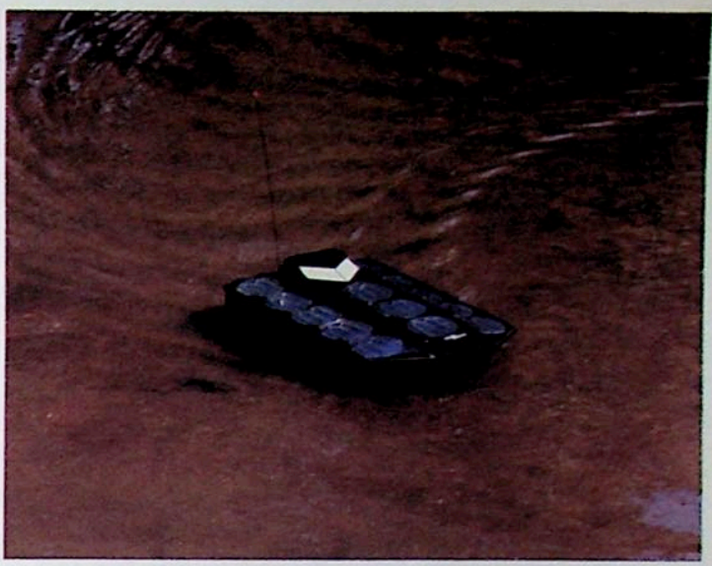
2. Bevel the top sides of the bridge



Internal arrangement, with 7.2-volt battery pack (motor should be water cooled).



Close-up of 380 motor and micro-switch arrangement.



Planing along under battery power.

deck frame. This provides the coaming for the cabin to fit over.

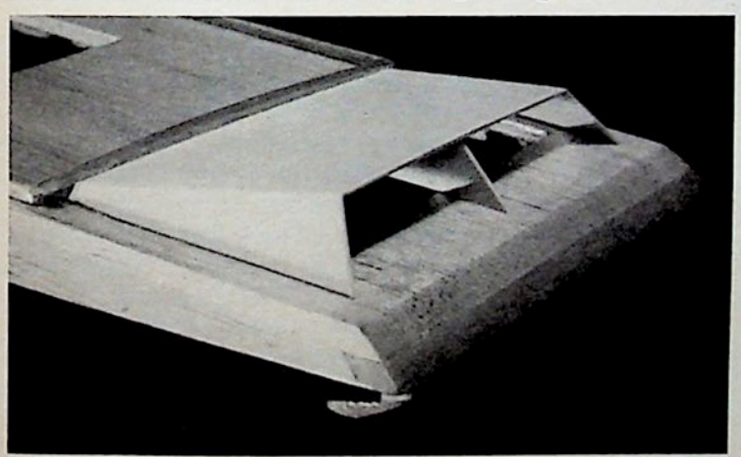
3. Sheet the underside of the bridge deck with the grain running crosswise between the bow and former D1. Sheet the remainder with the grain running lengthwise.

4. Sheet the hull sides traced and cut from the plan followed by the bottoms which are marked and cut on the model, noting the direction of grain which changes at frame C.

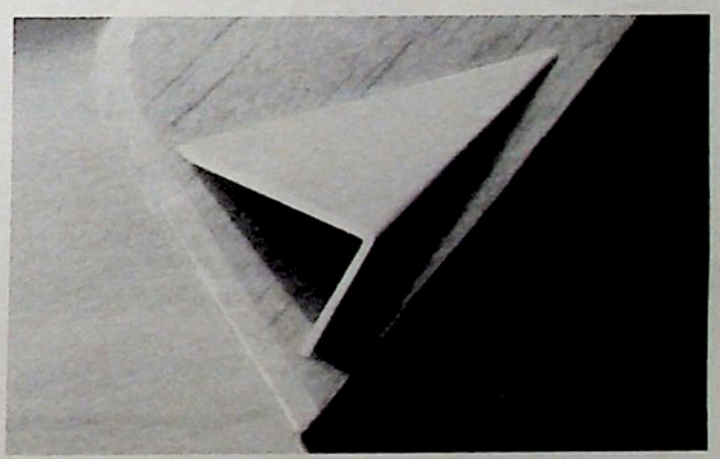
5. Sheet in the stern on the bridge deck, and the rear cabin coaming and glue the two hulls to the bridge deck sides with the hull decks 5mm (3/16-inch) below the tops of the coamings.

6. Assemble the cabin over the hull coamings and glue formers B2, C3 and D4. Sheet in the top after first cutting out the center for the solar cells. Glue the cabin back and top followed by the windscreen. I suggest you make a paper template first to get the angles right.

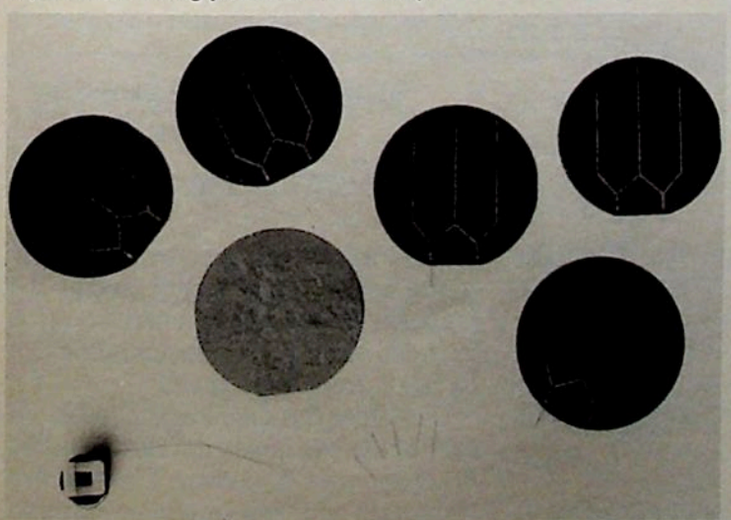
7. Cut the solar cell frame edges from 3mm (1/8-inch) sheet into 5mm (3/16-inch) strips and glue to the cabin top and to the inside edges of the hulls leaving clearance for the cabin sides. The outer hull edges and stern are cut from 9mm (3/8-inch) sheet and tapered at the bow. These outer edges should be 5mm (3/16-inch) above deck level. Camber the edges of the cabin solar cell frame to make it less obtrusive. Finally, glue the streamlined outer fairings to each side of the cabin sides at the rear



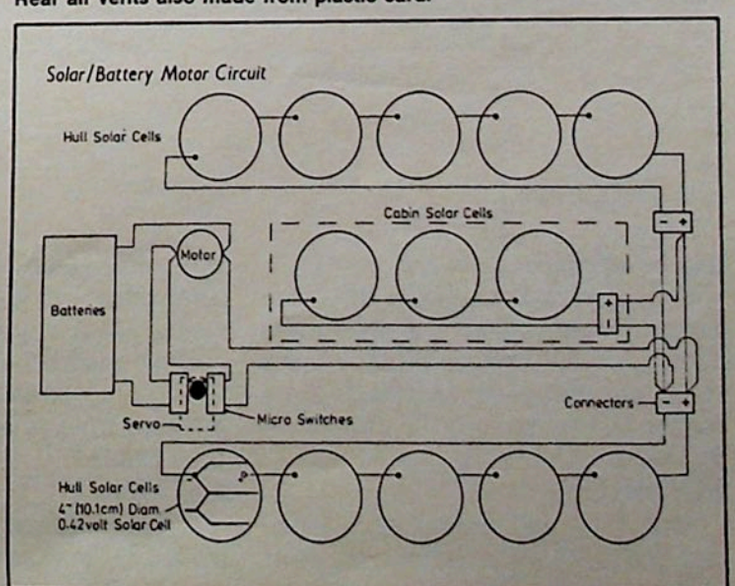
Top detail, showing plastic card air scoop.

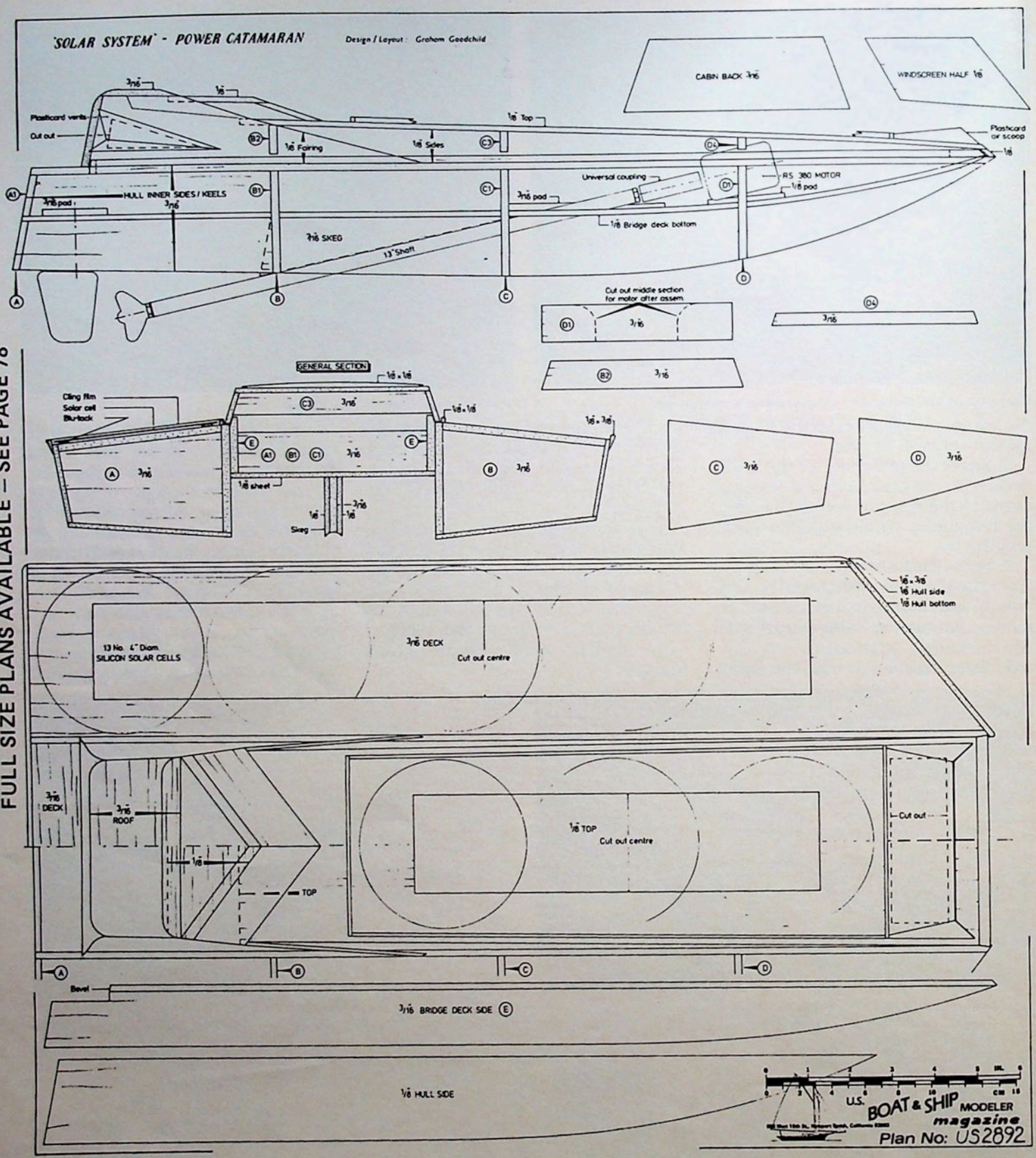


Rear air vents also made from plastic card.



Some of the four-inch diameter solar cells, with copper connecting wire. Note silvered underside of one cell.





FULL SIZE PLANS AVAILABLE – SEE PAGE 78

and bevel edges.

8. Construct the propeller tube skeg from three laminations of sheet balsa as shown and glue in place with the motor mounting and rudder shaft pads. Bore out the hole for the propeller tube to fit and epoxy to the skeg.

FINISHING

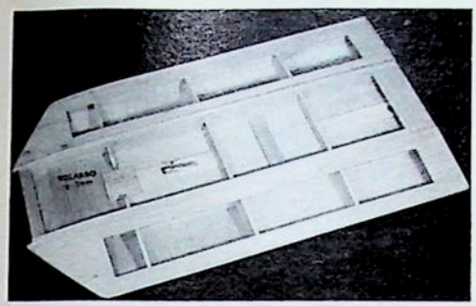
Sand down and seal the balsa structure and finish with enamel to the color of your choice. The prototype model was painted black overall to match the solar cells, with gold pin stripe lining, courtesy of a car accessory shop and the cockpit windows picked out in gray.

The airscoop and rear vents are constructed from plastic card, glued and then painted.

FITTING OUT

9. The motor and running gear is installed in the usual way. Most 380 motors are supplied with a mounting bracket which can be screwed directly to the balsa pad and bent to suit the propeller shaft angle. If a bracket is not included, then a suitable mounting can be made from alloy sheet.

10. Solder the solar cells together on each of the two hulls with short lengths of copper wire, as shown. The cells are wafer thin and very fragile so extreme care is needed in handling them. The positive is the underside where the wire



Two cat hulls joined to bridge deck. Note motor and rudder mounting pads, and oil tube to stuffing box (drive shaft tube).

can be soldered anywhere on its silvered base. The negative contact is on the upper face on one of the two silvered V-shaped vanes at its route.

11. Carefully mount the cells with Blu-Tack to the hull decks. The cells on the cabin are fastened to the underside with tape. The three banks of cells are wired together via screw type connector blocks to the motor and servo operated micro switches, as shown.

Household cling film stretched across the top of the cell frame edges and trimmed, protects the cells from water splashes.

Initial trials were made with a 7.2 volt battery pack which gave adequate planing performance with a 35mm propeller, although the motor did run a little hot. A 32mm prop was tried with a 5-volt pack and with the lighter load speed was about the same but the duration shorter.

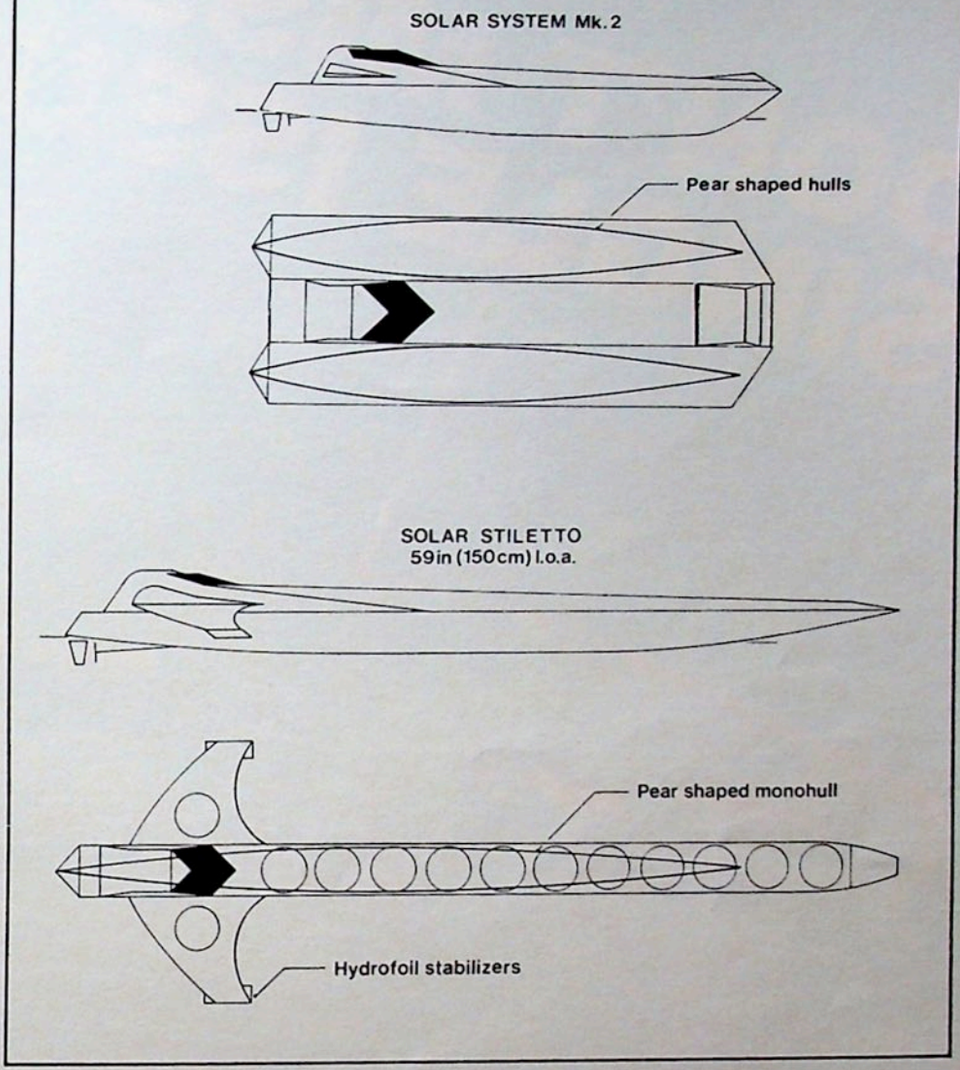
Under solar power, the 32mm prop seemed to give the best all around performance. For complete self-contained independence the solar cells could be wired to charge the batteries.

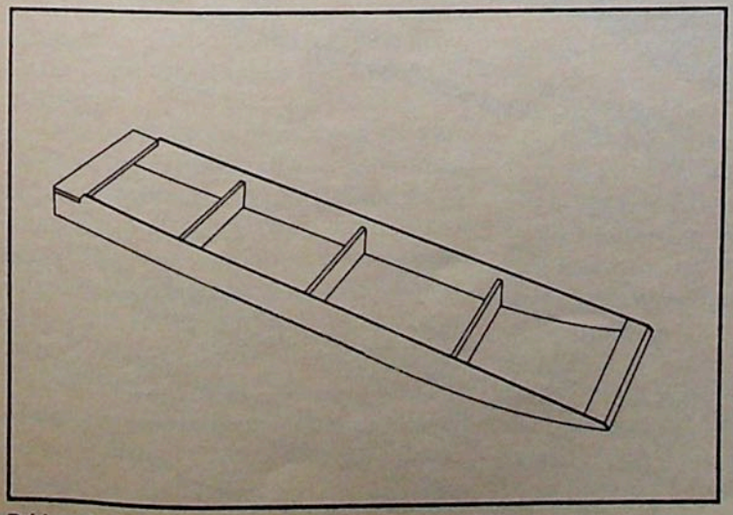
I am certain that with the experience gained with the model, solar cells do provide a viable form of protection for the boat modeler. The weight savings over conventional battery packs when just using solar cells alone is obvious, coupled with unlimited free power and life span of the cells.

Since completing Solar System I feel the next step is to try and increase the displacement speed under solar power alone, and to achieve this I suggest a catamaran design similar to Solar System but with the hulls pear shaped as on racing yachts, as the diagram illustrates. Also shown is another idea for a pencil-thin monohull design.

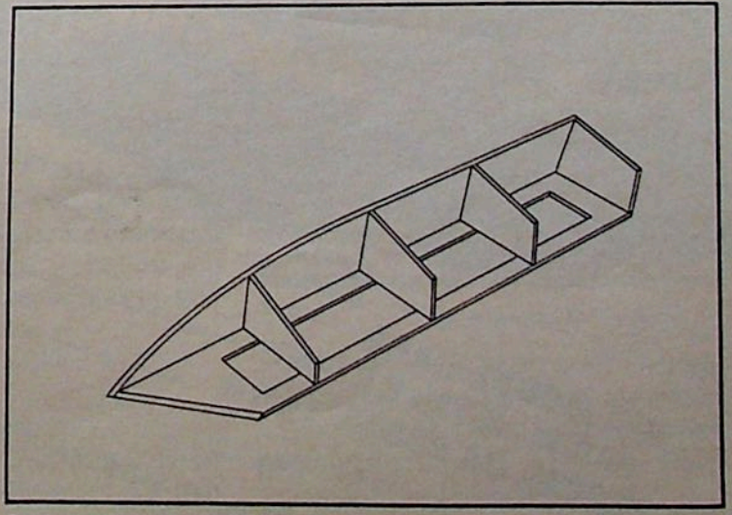
Unfortunately, I do not have the time to extend these ideas further at present as I'm in the middle of working on a book on radio controlled model boats. I'm three months behind. So perhaps someone out there could come up with a model on these lines which we may see in future issue of USB&SM. How about a contest for the fastest solar powered boat? The only rule I suggest is that a maximum of 13 cells are used to keep the cost within a reasonable level. •

Solar Powered Contest Designs



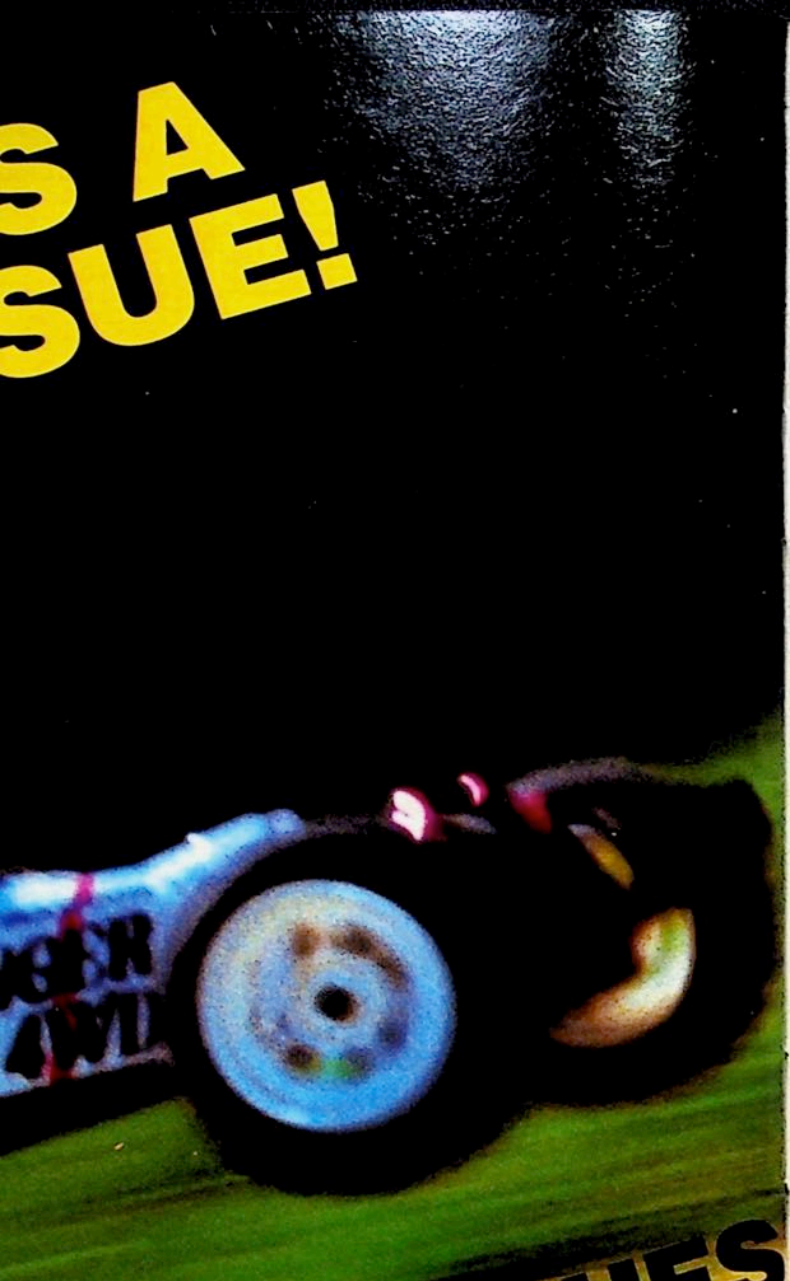


Bridge deck frame.



Starboard catamaran hull frame (upside down).

S A SUE!



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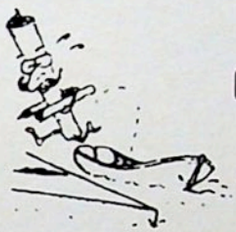
Waterlines . . . . *Continued from page 61*

problem. A quarter-scale airplane very often has difficulty in flying at one-fourth the speed of the prototype. Aircraft speed is proportional to the wing loading, no matter the size. Models are generally between one-half and two pounds per square foot, which is a range of fifteen or less to sixty mph. With lift proportional to the square of the scale, and weight to nearly the cube (with conventional materials), things get complicated! Even so, 1/4-scale is generally accepted as quarter-scale size and realism in flight may be set aside.

Small scale sailboats are almost impossible. . . regarding realism, not enjoyment! At 1/8-scale, realism is getting close, but often liberties are taken below water! Scale models of displacement hulls of power boats are often quite "rolly', with non-scale periods. Speedwise, a model moving at scale speed just doesn't have "the right bone in its teeth." It has to go faster, as the preceding calculations indicate.

I have a proposal to toss at you gentle readers. Each of you send me a not-too-detailed opinion of scale-boating performance and why the above Froude comparison appears non-scale. Let's make it just sail and power displacement hulls. I am *not* discriminating against you Camarillo Pond Rats. . . Racing models don't have this problem!

I will match your inputs and forward them to the Matchers/Matchees, so include a stamped, not addressed envelope. Each of these pairs will contact each other and send me a copy of their opinion. I will prepare an article compiling all these brilliant inputs (who knows, we may discover a new William Froude or Osborne? •



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Power Boats . . *Continued from page 31*

fellow columnist, now has his very fine running DF Sport 40 available in wood-en kit form through Northwest Hobby Supply, 13923 Pacific Ave., Tacoma, Washington 98444. Ordering information is available by calling 1-800-541-0645. The boat is available complete with hardwood and epoxy-glass cowl. I know I'm biased, but this really is a fine running Sport 40 and my son and I both have trophies to back up that statement.

NEED A GOOD FIELD/ POND TOTE BOX?

I have had the opportunity to use the new field/pond tote box from Byron Originals. Although the folks at Bryon Originals were probably thinking mostly of model airplane fliers when they offered this plastic field/pond box, it really does have terrific application for model boaters. Because it is plastic, it is lightweight, waterproof, and very maintenance free. Check with your local hobby dealer or directly from Byron Originals, P.O. Box 279, Ida Grove, Iowa 51445. •

ICBM . . . . . . *Continued from page 45*

from the factory to be the best. The centrifugal clutch is a fun option to have on a sport boat. A crowd of people were watching during one of my runs when I released the throttle while the boat was still out in the lake. The boat come

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to a stop with the engine idling quietly and the clutch disengaged. Some of the spectators were wondering what I'd do, as the engine was running, but the boat wasn't moving! They were taken by surprise when I pressed the throttle trigger and the ICBM took off again.

I know I'm going to enjoy running the ICBM. I will be able to operate it on days when my other boats would have trouble getting off the beach. The ICBM can be run on bodies of water where my other model boats cannot be run. It will run all day on a gallon of gasoline/oil fuel costing considerably less than the price of competition glow fuel. All I'll need to take with me is the ICBM, my transmitter, and gas.

"Weedeater" powered model boats have a great deal to offer in terms of just "good old fun." The ICBM from International Hobbies definitely receives my endorsement as a good looking, fine running package for this facet of model boating.

PRODUCT INFORMATION

International Hobbies, Inc., 1506 Timberline Road, Ft. Collins, Colorado 80524 - Call toll free - 800-445-2201 •

Avenger . . . . . *Continued from page 33*

from Bru-Line or Speedmaster.

This is a very fast combination. The OPS .80 is capable of pushing the Avenger to extremely high speeds. When building the kit, it is necessary to prepare the boat to handle high speed. A standard servo will not turn this thoroughbred combination.

Fast outrigger hydroplanes are functionally beautiful designs. Large roostertails, curving around the buoys, catch the sunshine. Coupled with the high revving engine sounds of modern ABC engines, hydro classes draw excited crowds. But if those boats aren't under the drivers' complete control, they are a danger to themselves and spectator alike.

To control this Avenger, a Futaba 3-EGX radio with a super heavy duty S-34 rudder servo was used. The S-34 servo is quick and has tremendous torque. Rudder pressure can be so great as to dislodge the servo inside the radio box. Mount the rudder servo firmly. An aluminum servo mount was built, similar to a motor mount in function.

The servo is bolted into the servo mount and the mount bolted through the hull floor. Because the S-34 is very large, it had to be installed on its side. The rudder linkage is kept as short and as straight as possible. Long linkages will tend to flex under pressure, shortening rudder throw.

Just as the rudder servo must be set up to withstand extreme pressure, the rudder itself must take a beating. The Speedmaster wedge rudder design is built for use with .40 to .90 size hydros. With the rudder assembly installed, the rudder will be too long, creating extra drag. After test running your Avenger, you will want to cut the rudder off to be 1/4 to 1/2 inch shorter.

Rudders such as the Speedmaster, Steve Muck, and Power Products, have built-in water pickups. These integral water pickups are very effective and do not create additional drag.

Water must be routed from the rudder pickup point to the engine's water cooled head. The simplest route is through the radio compartment. However, as every model boater will tell you, water in the radio box means disaster. A section of 1/4 inch I.D. brass tubing was epoxied through the radio compartment.

This solid section of tubing creates a tunnel through the radio box. Silicon tubing is then slipped through the brass tunnel, routing water from the pickup to the engine. If the silicon tubing springs a leak, the water just runs out

Continued on page 71

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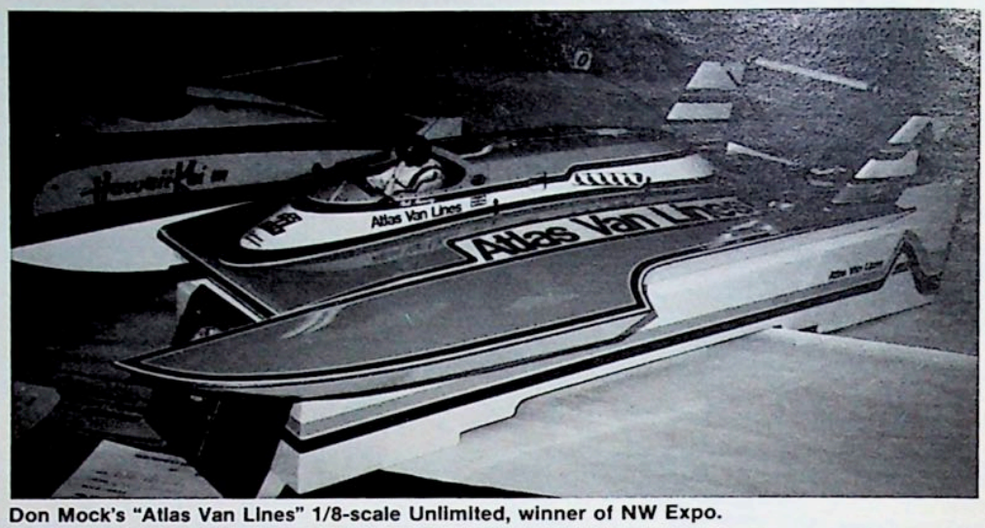


Don Mock's "Atlas Van Lines" 1/8-scale Unlimited, winner of NW Expo.

When I first got interested in R/C model boats, I bought a .60 hydroplane kit and everything else that was recommended to make it work by the man on the other side of the counter at my local hobby shop. I put it together with my limited knowledge of R/C models and the few tools I had. My first attempt to get it started was a failure. The engine had so much compression it would not turn over. So back to the hobby shop I went. The salesman I talked to was not very knowledgeable in R/C boats. All he could recommend was to contact someone at the local model boat club. He gave me the phone number of Jerry Dunlap.

I called Jerry and he gave me directions to his house. When I got there I set up my boat on a table and he looked it over and said, "I used to have one of these." He got it to start and pointed out several things I would have to change to make it safe to operate on the water. After about two weeks of trial and error, it finally ran. It wasn't very stable or reliable. By then I was interested in the racing aspect of model boating.

Jerry informed me that the boat I had would not be competitive in the class it would race in, and after seeing a race I was reassured of it. With the help of Jerry and other model boaters, I was able to put together a boat that was competitive. I joined the Puget Sound Model Boat Club and won my first race. The rest is history.

This has been a description of many typical beginnings in model boat racing. Many people are not aware of model boat racing or choose not to seek out a club. In some cases this can lead to a lot of frustration when a boat won't work like you think it should. And some will get out of model boating and find a new hobby.

In the four years I have been in the hobby, I have yet to see an experienced model boater who would not go out of his way to help a beginner or any other competitor. If you have a model boat and are having problems with it, I strongly recommend asking someone at your hobby shop about clubs in your area. If the hobby shop can't help you, try writing to one of the following national organizations.

NATIONAL ORGANIZATIONS

The American Power Boat Association R/C Model Racing Commission was just established in 1988. The majority of its members are located in central and northern California, the midwest and northwestern states. To contact the APBA MRC, write to Wally Stewart, 5001 Stormy Ct., Bakersfield, California 93309.

The International Model Power Boat Association (IMPBA) has been around since the late '40s with tether boating and later radio control. Most of its members are located in the eastern and southeastern states. To contact IMPBA, write to Sue Bathauer, 1042 S. Muessing Rd., Indianapolis, Indiana 46239.

The North American Model Boat Association (NAMBA) was established in the early '70s. It has a strong membership in Southern California and a good base of members throughout the U.S. To contact NAMBA write to Myrtle Coad, 6073 Sunrise Dr., Lower Lake, California 95457.

The APBA MRC is a group of model boaters who were dissatisfied with the way things were being done with NAMBA and contacted the American Power Boat Association (the organization that sanctions all forms of full scale boat racing in the U.S. and abroad), about providing insurance for model boat racers through membership in the APBA. The APBA was delighted with the idea and one year of racing has been successfully completed under this new organization. Included in that first year were the first APBA MRC Nationals in Wichita, Kansas and the Magic Mountain Grand Prix at the Magic Mountain Amusement Park near Los Angeles, California.

These events, among others, have proven that the APBA MRC is here to stay and looking forward to a future of growth. I believe that if any organization could handle the consolidation of all model boaters it would be the APBA.

R/C RACING CLASSES

The scope of this article is to explain

Bill Hornell starts engine in his Leecraft 40-60 Deep Vee.

how beginners can become involved in model boat racing and the types of classes their boat, or future boat, would compete in. As I am a member of the APBA MRC, I will explain a little about each class in my organization. IMPBA and NAMBA have very similar classes but you should contact them for any details if they are the organization your local club belongs to.

ENGINE AND HULL CLASSIFICATION

Gas engine sizes have been broken down into four groups: 0-3.5cc, 3.51-7.5cc, 7.51-11cc, 11.01-30cc.

The two basic hull configurations are monoplane and hydroplane.

ELECTRIC COMPETITION

Electric competition is still in its infancy. Not until recently has technology made available the motors or batteries to perform at a level comparable to gas powered boats. The APBA MRC has come up with a set of probationary electric rules for 1989. These include classes for stock and modified 05 motors and unlimited motor classes with various battery combinations. It will take some time to see what becomes popular before any definite classes can be established.

JENDURO COMPETITION

An enduro race is run on a prescribed course for a predetermined amount of time. The boat to complete the most number of laps in the specified time is the winner. The APBA MRC supports Deep Vee and 100 lap team relay marathon competitions. The 100-lap team relay marathon has been an exciting part of National Championship Regattas.

KIDS' COMPETITION

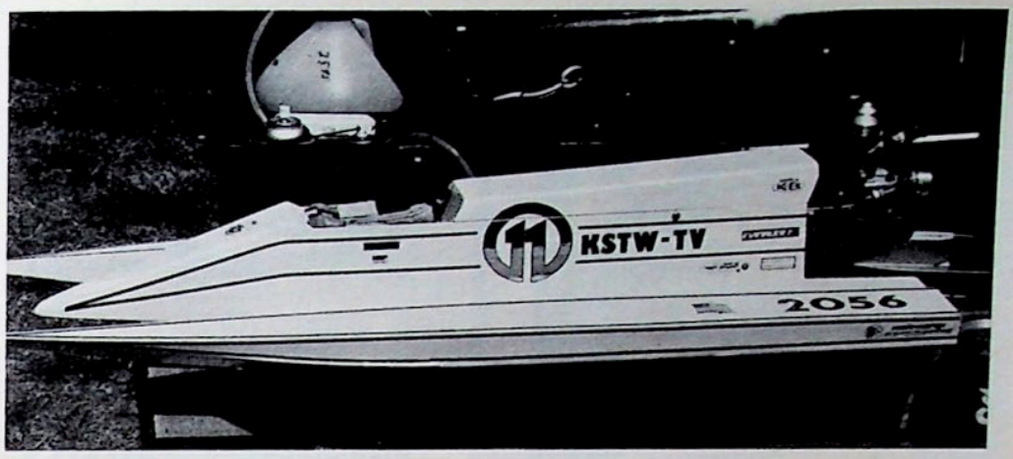
This is a class intended to aid the development of youth and youth activities. The entrants must be 12 years old or younger. Only 3.5cc mono, outboard mono, or tunnel hulls will qualify. Racing is conducted in 3-5 minute enduro type with laps being counted.

OFFSHORE COMPETITION

The intent of offshore competition is to race boats which resemble authentic APBA/VIM offshore boats. They must have engine hatches and driver figures. Engine sizes must comply to the APBA MRC 3.5cc, 7.5cc, 11cc, and 30cc displacement limits. The type of engine (inboard, outboard) must be consistent with that of the real boat being modeled. Racing is conducted on an irregular shaped course with left and right-hand turns in an enduro format.

OUTBOARD COMPETITION

The APBA MRC supports classes for stock and modified outboard racing. The most popular form of outboard racing is the stock OPC tunnel class. The hulls usually look like full size tunnel boats and, due to the stock engine configuration, are closely competitive. Racing is conducted with a countdown to a flying start and 4-6 laps to completion.



Dunlap 7.5cc Tunnel, from USB&SM plans.

SPORT HYDRO COMPETITION (Sport 40)

The intent is to emulate scale unlimited racing. The hulls must be of unlimited or limited design. They must be attractively painted and detailed in the spirit of limited or unlimited racing. Each boat must have a sponsor's name or logo of the participant's choice (may be real or fictional). Minimum hull length is 35 inches and the maximum engine size is 7.5cc. The APBA MRC supports two divisions of this class. Division I is limited to a front intake loop scavenged engine with no schnuerle or perry ports and no rear rotors. Tuned pipes are also not allowed. This class is most popular in California. Division II allows any engine that conforms to the 7.5cc engine classification and tuned pipes are allowed.

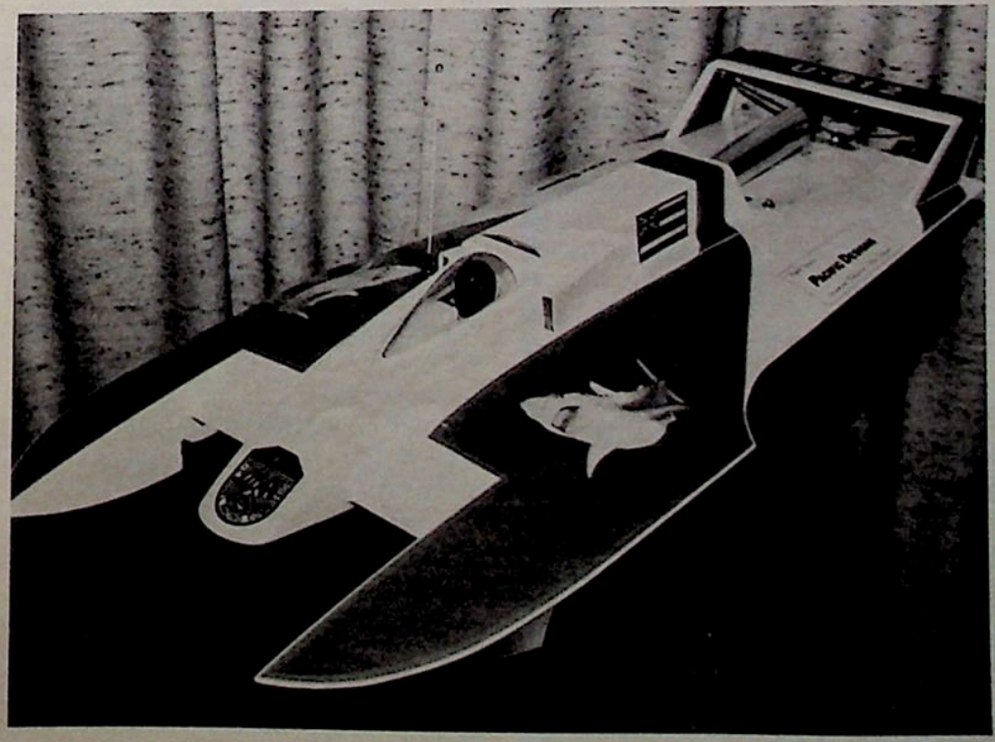
SCALE UNLIMITED COMPETITION

Scale unlimited is meant to duplicate the unlimited class hydroplane as closely as possible. The hull must be built on a scale of 1-1/2-inch = 1 foot and follow a tolerance of actual scale of 10%. The actual scale dimensions of the boat are derived from the APBA MRC unlimited hull roster. The engine size is a maximum of 11cc. The boat must be painted to resemble the real unlimited it is modeled after. Racing is conducted with a countdown to a flying start.

Besides providing rules for competition, national organizations will insure running sites for personal injury and property damage. A 50 mph model boat can do a lot of damage and most city and county parks will require a minimum of a one million dollar liability policy.

Another benefit of model boat racing is fellowship. This is a good activity the entire family can be involved in and you will gain many friends.

If you have any questions about model boat racing, write to me at 8907 34th Ave. So., Tacoma, Washington 98409. Please include a self-addressed, stamped envelope for a prompt reply.•



Another from USB&SM plans, a Dave Frank Sport 40 by Fred Capellas.

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Avenger . . . *Continued from page 70*

the end of the brass tubing, not into the radio compartment. This is a simple and effective method to supply cooling water to your engine.

Trim the cowl to clear the engine and tuned pipe. Also cut holes in the cowl front so that air can get to the carburetor. Keep these air holes high enough so that water coming in the holes will not drown the engine. The cowl is held in place by the lip in front and whatever method you prefer at the rear. Either a clip, or a screw on each side with a rubber band stretched across the cowl will keep the cowl from falling off while running.

No matter how well you keep the cowl held down, it will eventually be thrown off, or dropped in the lake. Fiberglass will sink. The Avenger cowl will sink unless you install flotation. Use foam epoxied inside the cowl where it will not be melted by engine or pipe heat. It doesn't take much foam to get the job done.

Finish the boat with two-part (epoxy) paint able to withstand high nitro fuel. I primed the hull first with two sprayed coats of clear paint. Then sand the hull with fine wet/dry sandpaper. The wood used is excellent and will require very little sanding other than to remove the grain ripples. Two coats of bright yellow were sprayed onto the boat. Use bright, easy-to-see colors. Boats painted with dark or flat colors tend to blend into the background when the boat is dead in the water. It is not the fault of other drivers when they hit a boat that is painted a dark or flat color that can't be seen.

The first time I ran the Avenger, the strut was set so the stub shaft was centered on the rear sponson bottoms. The flat strut bottom helps lift the hull so you don't have to use much prop angle to lift the transom. Try only a few degrees of strut angle and an Octura X462 propeller.

When the Avenger is set up correctly, the rear sponsons are out of the water when running the straightaway. There will be no spray coming off the front sponsons when the boat is at speed. This means there is very little drag. The engine's power is used to fly the boat above the water, not push it through the water.

When your AVENGER is running right, try different props. At 3500 feet above sea level, the OPS .80 easily turns an Octura X465. At 4300 feet, I use an X462.

Running 50% nitro fuel and the Steve Muck tuned pipe at stock length, the Avenger will hold Lane One with only a little throttle work. Going down the straights at full speed, cut the throttle a little, set the rudder, then throttle up and the boat holds Lane One, accelerating out of the turn.

If you are looking for an easy-to-build and set up outrigger kit, call Avenger/Spider Boat Manufacturing (2300 Cable Drive, Meraux, Louisiana 70075 (504) 277-1923). Don Wagner has fast designs and will be happy to help you get your hydro in the water. Don't build this kit if it is your first R/C power boat. It is just too easy to go fast and a beginner will soon find himself going beyond what he can control safely. But, if you have been running boats and are ready to feel the ultimate thrill of high speed, roostertails, and a singing tuned pipe; get your Avenger ready and we'll see you at the races. •

Radio Waves . . *Continued from page 34*

Venezuela. Both of these actions, as well as many other industrial and military applications, are done with radio signals every minute of the day. . .and night!

And last but not least, you are a contributor! Well, of course I don't mean *you*, but the rest of them certainly are. Take a look around you next time out. You are going to see the largest collection of the cheapest and the oldest R/C equipment to be found outside a model

museum. And how about some of those modifications? I know, this doesn't apply to all of you and to all classes of boaters, but in general, the above is true. Anyway, the cheapest and the oldest is simply not as good as the newer more expensive designs. In the case of transmitters, their emitted signal might be wide enough to get over into the adjacent channel and the receiver might not have a reception "window" narrow enough to reject adjacent channel signals.

To make matters worse, there are the illegal frequency users. There are two types of such friendly folks. Not everyone sporting a channel 62 to 90 flag is on those frequencies. You will still find a few of the older 72 and 75.640 MHz systems in use still on their original frequency, but with a flag for some 75 MHz channel. The older 72 MHz shared frequency users simply found a new 75 MHz channel not in use at the local site and claimed it as their own; 75.640 MHz became 75.630 since that is the closest of the new frequencies. This seems to be acceptable to such people since they know that the FBI is not likely to come after them for violating federal law, but depending on what other frequencies are in use, they can cause severe interference problems, and be subject to being interfered with themselves.

Next are the guys who have discovered that on some types of equipment, they can interchange the transmitter and receiver crystals, which is believed to put them off on some personal frequency all their own. What it actually does is to put them 455 KHz above or below their original frequency, closer to some other R/C channel, and now with improperly tuned equipment, because such changes require "peaking" of both the transmitter and receiver for optimum operation. Even disregarding the possibility of interference to and from other systems, such equipment is simply not operating at its design efficiency and can be expected to perform poorly at best.

Both of these procedures are completely irresponsible, and individuals so doing should be banned from any R/C site for the benefit of the rest of the group. Extreme cases should be handled...well...you could find some sort of anchor out there, could you not? How to check for this? Well, in any case of doubt, and certainly before any major event at which large numbers are to participate, individual equipment can be checked for proper crystallization. Only the transmitter need be checked; the crystals are generally marked with a tab stating something like "TX 62'. If the tab looks tampered with, the crystal itself can be inspected and will be found to have the operating frequency etched on the case, impossible to change in any form.

There are frequency scanners, monitors, and spectrum analyzers which can be used for the same purpose, but these are priced beyond the reach of most individuals and usually most groups.

So much for interference from other sources, let us now take a look at what we are doing to ourselves. And how we can check for it. R/C'er to R/C'er interference can come in various forms: (1) another R/C transmitter of your same frequency, (2) adjacent channel interference, and (3) 30IP. We'll take them one at a time, but first let us clarify a point. Your R/C system will be interfered with when your receiver is subject to an RF signal of greater amplitude than the one coming from your transmitter. In other words, the loudest voice is going to be heard, the strongest light is going to be seen! We do not have completely free frequencies, *ever*! If nothing else, there is always ambient radio noise on the entire radio spectrum, the hiss punctuated with bursts of static that you hear on your broadcast receiver between stations. Any time your R/C receivers hears a signal stronger than yours, it listens to it, and ignores you!

An example of (1) above...it's obvious! Some uncaring or unknowing soul "turns on" without verifying that the frequency is clear, and we soon have a classic case of, "I ain't got it"! It may not happen immediately, if you and your model are on one end of the pond and he is on the other, but as soon as your boat crosses the line at which this clod's signal is stronger than yours...Zap! There is no R/C system now on the market than can operate under this kind of interference, regardless of the claims that you may read.

However, there is an important feature to remember. With an AM or FM system, an interfering R/C transmitter will not only obscure your signal at the receiver, but will actually drive your servos and also your model into unwanted positions...usually the nearest bank. However, and this is an important point, with a PCM (Pulse Code Modulated) system, there is a "Fail Safe" feature that can reduce the effects of the interference, and sometimes the subsequent damage. If another R/C transmitter on your frequency does come on, your transmitter still loses control, but your receiver also ignores the interfering signal and the servos do not move randomly. Instead, they are moved to whatever preset positions you determined are best suited for your particular model under no-control conditions.

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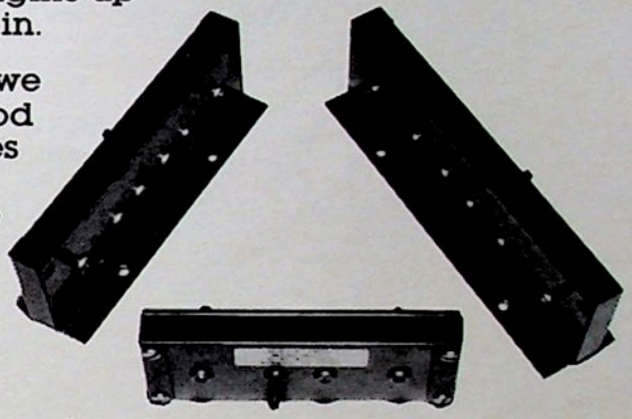

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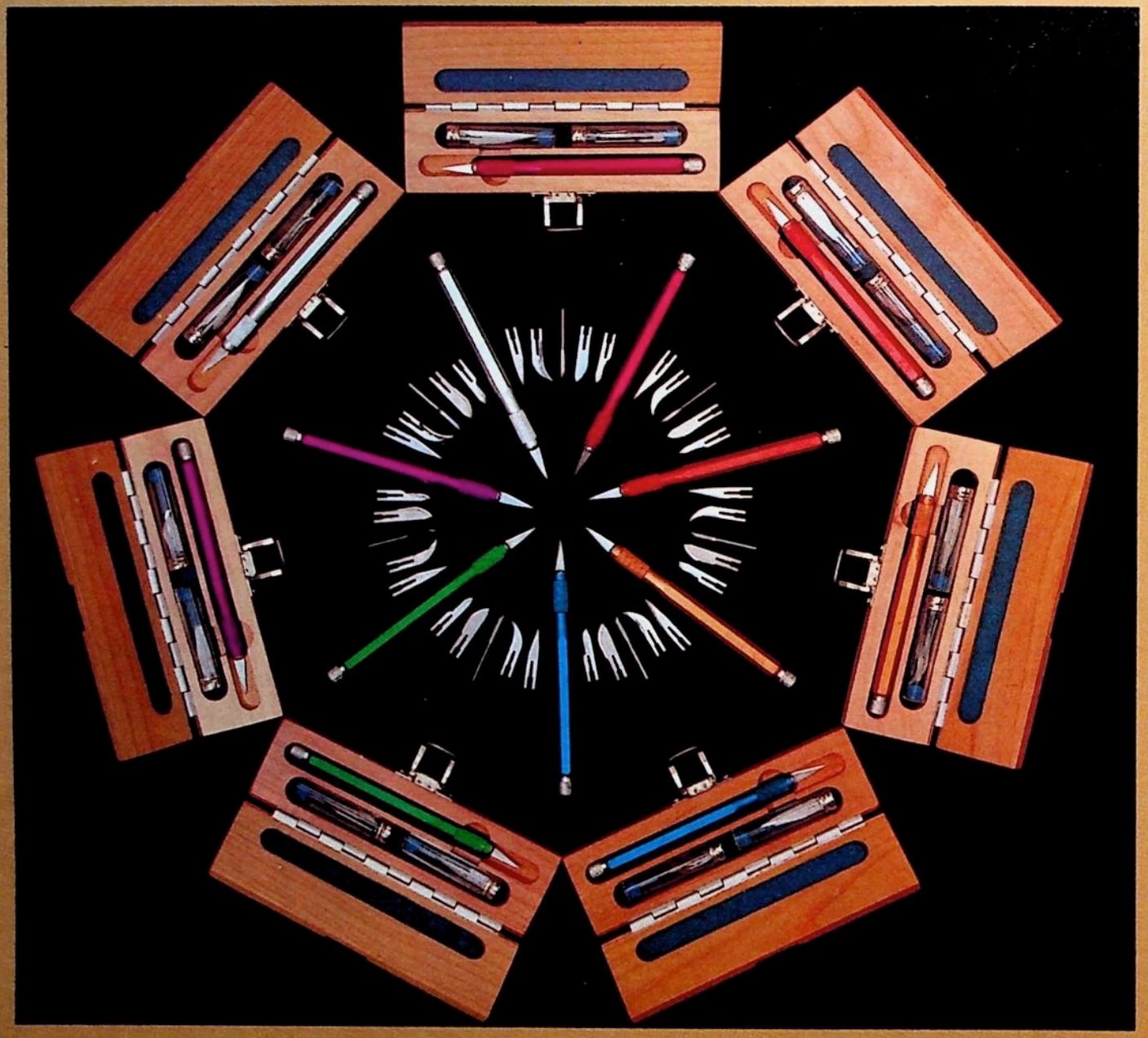

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Obviously, some luck is still to be hoped for, but this is still better than having the controls moving constantly.

Now, example (2), adjacent channel interference. This can be caused by either the receiver or a transmitter, and to understand it, you are going to have to accept some unseen facts. First, the width of a transmitted signal can vary, and often does, being wider with older equipment than with current models. Similarly, the width of the signal the receiver will accept can also vary, the current "narrow band" models being designed to operate with signals much slimmer than older versions. There are more technical explanations for this, full of such terms as "signal level ratio" and "dB down", but think of it simply as a matter of space. If you have a wider, er, stern, you need a wider doorway than your skinny friend!

Distance enters the formula to some degree, as both the receiver's sensitivity and transmitter's signal strength drop as they get further separated from one another.

Adjacent channel interference will happen when a wide band receiver and a wide band transmitter are being operated on channels adjacent to each other. There are scientific and highly precise tests for this phenomena, all outside of our ability to perform, but a simple and practical "go-no-go" test can be made to determine system compatibility. Refer now to the "Adjacent Channel Interference Test". By moving the adjacent channel transmitter closer or further from the model, it's effect can be observed. Through experience, we have established a minimum distance of 20 feet as being adequate for no-interference operation of the two transmitters under test. Any less and some troubles are to be expected. Start off with both transmitter antennas at approximately 45 degrees to the model, and move the adjacent channel transmitter to a point where control by the main transmitter becomes marginal. You can now prove another important fact when it comes to solid model control. . . antenna (transmitter) to antenna (model) orientation. If you move the adjacent channel transmitter's antenna from the 45 degree position to having it pointed directly at the model, you will experience a reduction of its effect. Similarly, with that antenna now back at 45 degrees, and the control transmitter's antenna now being the pointer, you will notice an increase in the effect of the interfering transmitter.

Here we are back to that business about the relative strength of yours and the unwanted signal at the receiver. As you increase or decrease either of these signals (at the receiver), the effect is readily noticeable.

Which brings us to (3) on our list of common causes of interference. Third Order Intermodulation Products (3OIP) can be generated at any R/C site and are the cause of a known characteristics of all RF generating devices. It so happens that when two frequencies are mixed, four frequencies result. These include the two basic frequencies, plus the sum and the difference of them. This is often done under controlled conditions, and is actually happening in every R/C receiver. However, it can also occur under uncontrolled conditions whenever two transmitters are operated under close proximity to each other. One of the two new frequencies generated is of no consequence, as it is outside our area of interest. However, the other one is exactly on one of our other operating frequencies and poorly designed receivers are subject to being interfered by it. See now the sketch "3OIP Interference Test".

Notice that the transmitters are located similarly to our first test, except that we are now using two of them as the interference generators. And as explained before, varying the distances will vary the effect on the receiver. It has been found that an interference free distance of at least 30 feet between the culprit pair and the model must be attained for proper operation. Also, the effect of the 3OIP interference diminishes rapidly as the distance between the interfering transmitters is increased, usually lessening to an ineffective value at 20 feet or so. The best advice is not to bunch up on the bank. And as in the previous adjacent channel example, the interference effect also diminishes as the model moves away from the interfering transmitters and closer to its companion unit.

What channels interfere with what others? Well, many, if you look at the numbers. Not to panic, however, as with proper frequency control and people positioning, the effects of 3OIP can be pretty well controlled. It helps that most boats do not operate at extreme distances, and those that do, such as larger sailboats, can use full length receiver antennas with good height above the water for better reception of the main frequency.

This subject has been given a lot of space in the model press, mostly the airplane magazines (it is the greater numbers and better organization again!). If you have read some of it, you will have run into somewhat different terminology and acronyms, all personal inventions of the particular person attempting to enlighten us. What I have presented to you are standard terms used within the electronic and communications industry, some of them having been around

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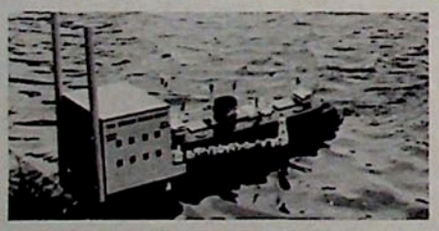

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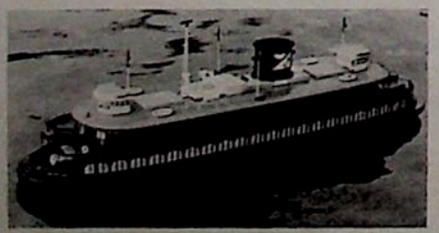

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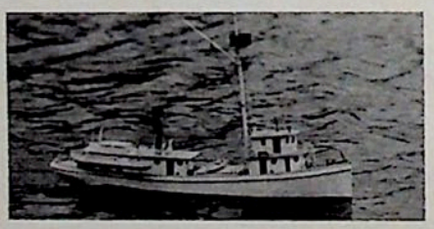

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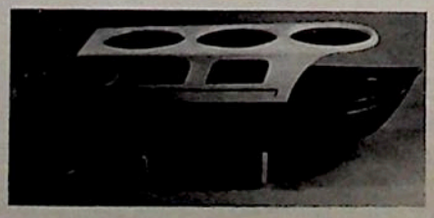

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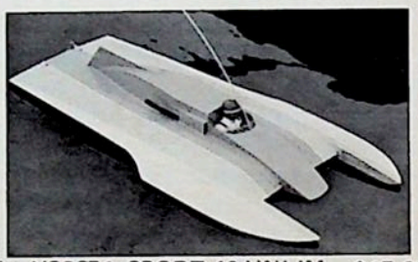

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All plywood construction of this tunnel design keeps down total cost. Good for beginners, but plenty fast! Dave Frank.

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All wood, 37" LOA, R/C tugboat with electric drive, bow thrusters, and device to retrieve other boats. Francis Smith.

since the pioneers were experimenting with "coherers'. In my opinion, introducing new and unknown words only further confuses an already confusing subject. It is too bad that Joe R/C'er has to concern himself with all these things anyway, as the hobby is one of modeling and not an electronic one. All those transistors and resistors should be only a means towards an end, and not of prime interest to everyone.

Last but not least is a table of possible 3OIP interference on the 75 MHz R/C channels. . . to my knowledge the first one generated. Remember, these are possibilities, not sure death we are talking about. Make the recommended tests for yourself, and take with a grain of salt any other model killing interference producing numbers combinations you might run into. Numbers can be made to do anything, but the worst case examples we are often given, which include multiples and submultiples, additions and subtractions, and might as well include the weight of the model

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and the builder's age, to arrive at the possibility of interference on Channel Something, are plainly ridiculous.

Enough talk — surfs up! Well, more wrong terminology maybe, but you get the idea! Let's go! •

Cap'n's Log . . . . *Continued from page 9*

electric civilian, submarine, and tug/salvage. For additional information, contact Bob Crawford, 5870 Adobe Falls Rd., San Diego, CA 92120, or Doug McFarland, 14120 Barrymore St., San Diego, CA 92129.

* * *

The Cincinnati Model Boat Club has scheduled its fifth annual Mini Regatta for July 1 and 2, 1989. The club donates 80 percent of the total proceeds from the race to the Cincinnati Local Chapter of the American Cancer Society, having raised over $3,000. the last two years. Contact CMBC Race Chairman Robert Hubbard, 1462 Tallberry Dr., Cincinnati, OH 45230, phone (513) 232-6917, for further information.

* * *

The Third North State Toy & Hobby Show will be held on July 8 and 9, 1989 at the North Carolina State Fairgrounds, 1025 Blue Ridge Blvd., Raleigh, NC. Show includes model ships, boats, trains, planes, and cars, antique and collectible toys, and other hobbies. Trophies in several categories and Static Scale Model Ships. For more information, contact Carolina Hobby Expo, 3452 Odell School Rd., Concord, NC 28025, phone (704) 786-8373.

* * *

The Northwest Commodores Scale Model Boat Club will host the 1989 IMPBA Scale Internationals at Lords Park, Elgin, IL, on August 12 and 13, 1989. For further information and registration forms, contact J. Robles, CD, at 34445 N. Keating Ave., Chicago, IL 60641, phone (312) 545-3552.

* * *

Task Force 96 Scale Model Ship Club will hold its Sixth Annual R/C Scale Model Regatta, Sunday, September 3, 1989, at Cerritos Regional Park, Cerritos, CA. For further info, send a self addressed, stamped envelope to Pat Myers, 5866 Orange Ave. #3, Long Beach, CA 90805-4146.

* * *

THIS IS A BIG ONE! Celebrating the Two Hundredth Anniversary Year of the foundation of the United States Coast Guard (1790-1990), the Custom House Maritime Museum of Newburyport, Mass., announces a Competition and Exhibition for Scale Ship Models. It is open to models of all vessels and craft of all periods that have served the United States Coast Guard, the Coast Guard Reserve, the Revenue Cutter Marine, the Light House Service, and the Life Saving Service. Models by both amateur and professional builders will be welcome. There will be Scratchbuilt, Semi-Scratchbuilt, Kit, Junior, and Ship in Bottle Divisions.

Remember, this contest is scheduled for July 15 to September 15, 1990. . not 1989 . . so there is plenty of time (relatively speaking) to research and build a model for this competition. For a complete registration packet, write or call Ship Model Competition, Custom House Maritime Museum, 25 Water Street, Newburyport, Mass. 01950, phone (508) 462-8681. The entry form contains a list of Coast Guard vessels for which plans are available from the US Coast Guard.

This should be an exciting and meaningful event, and the variety of boats and ships that qualify for the competition are almost limitless. We'll keep an eye on this one!

ROACHES IN THE PEAS!

Sounds pretty gruesome, but we're just trying to get your attention. What we're attempting to say is that AMYA (American Model Yachting Association) revised its specifications for the 36/600 class yachts in 1982, some of which affect the Pea Pod Mods article by Ken Cashion, published in our Spring '89 issue. AMYA Marketing Manager, and writer of this month's survey article on the Tahoe II, Barney Kemter, called our attention to the problem.

In 1982, AMYA limited the roach an the main and jib for the 36/600 class to 2.5 inches, which in turn, makes sail suits III and IV in Ken article illegal. Perhaps Ken's original article brought about the roach restriction! In any event, now you understand the reason for the raunchy sub-title!

HOT SHIP MODEL

Speaking of something illegal, it's

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also not nice to steal ship models from museums. In a recent San Diego Ship Modelers' Guild newsletter, it was noted that a prisoner-of-war model (circa 1810) has been stolen from the museum maintained by the Bostonian Society, Old State House, Boston, Mass. It is a bone ship model of an English frigate, with a British flag and colored pennants. It is fully rigged with human hair and horsehair. The figurehead appeared to be a Phrygian female figure. The model is approximately 19 inches long, 14 inches high, three-masted, and is mounted on a wood and bone base. It was stolen while on display in a locked (!) cabinet, on the afternoon of Tuesday, January 17th.

If anyone is approached for the repair or appraisal or sale of a prisoner-of-war model, please investigate the source carefully. If there is the least hint that it may be the stolen model, please call George Kaiser, Newsletter Editor, U.S.S. Constitution Model Shipwright Guild, (617) 846-3427, or call the Bostonian Society directly at (617) 720-3292.

INDUSTRY NEWS

Dynamic Models, Drawer C, Port Jefferson Station, New York 11776, phone (516) 928-8200, announces the purchase of the entire line of scale R/C fiberglass boats from Staubitz of Buffalo. This purchase will effectively double the line of models already offered by Dynamic, which includes tugs, USN warships, commercial vessels, and many scale boat fittings.

Among scale boat modelers, the quality of Staubitz models is already well known, and many of them can be seen in museums across the country. Staubitz will also be collaborating on future models to be offered by Dynamic. In fact, Dynamic will announce a new division to release this new line of R/C model boats. Watch USB&SM for further details.

* * *

If you're a small tool nut, you should send a large (4 x 9-1/2) S.A.S.E. to Armando Cimino, 41 Fenley St., Revere, MA 02151. You'll receive a free 1989 tool catalog, featuring hand made mini vises, a brass head hammer, carbide scriber, and other items. Check the precision hand vise with solid brass jaws that close without a gap, are guided by hardened and ground steel pins, and are reversible V-grooved for holding pins. The knurled steel handle has a black oxide, non-rusting finish. Now when a guy creates his business logo and names his line of products after his faithful canine companion, "Brandy," you know he can't be all bad! •

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- Easy to follow instructions; so even a beginner could build this high performance boat.

Weight (ready to race)	5 lbs.
Length overall	32½"
Hull length	28½"
Beam (width)	8½"

To complete Monster-Vee we recommend: 2-channel radio system ARK0081 or ARK009, two 8.4 volt nicad packs (GR3418), two different colors of Pactra Spray paint (PAC7250 to PAC7267), tube of silicone rubber (DEV250).

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